Coal Age

MAY, 1955

A McGRAW-HILL PUBLICATION—PRICE 50¢

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How Hydraulics Serve Georgetown Plant . . . p 96

Akremite—The "Make-Your-Own" Strip Explosive . . . p 70

R-4 LAMPS — Brilliant, unfailing, effective light that means added safety for the miner, added production for the mine.

Spotlighting M·S·A Equipment

OF IMPORTANCE TO YOUR MINE SAFETY AND PRODUCTION

...at Booth 1009-Coal Show

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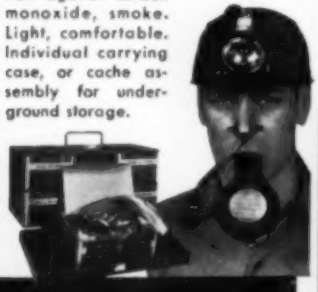

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When you have a safety problem, M·S·A is at your service. Our job is to help you.

MSA

-Own" Strip Explosive . . . p 70

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A typical example of B. F. Goodrich improvement in rubber

COAL gets packed in those freight cars so tight it won't come loose when the hopper at the bottom is opened. Men used to crawl in the car and using pick and shovel, break it loose. Sometimes it took two men eight hours to unload a car, and more important, it was dangerous.

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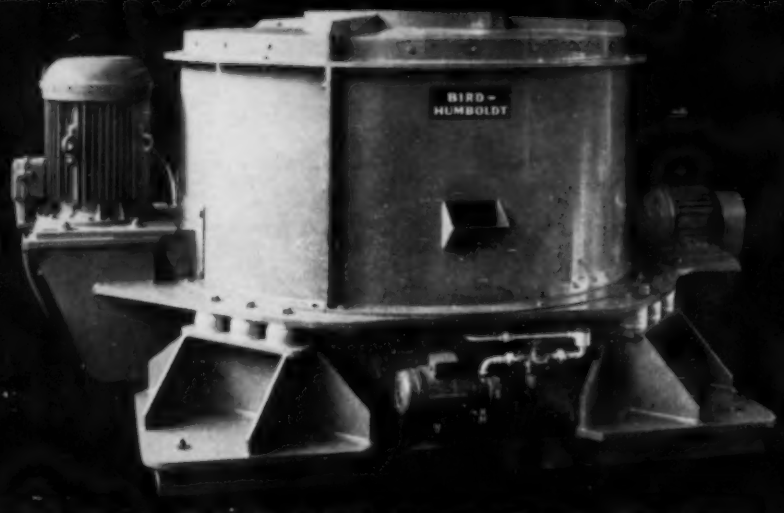

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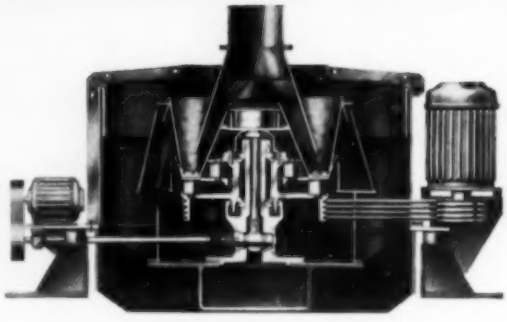
VIBRATING SCREEN, CENTRIFUGAL
FINE COAL DRYER

Before you spend money for fine coal dewatering equipment of any kind, find out what this new Bird-Humboldt Centrifugal Dryer may mean to you in terms of

- **longer screen life**
- **higher coal recovery**
- **higher capacity**
- **lower power per ton**
- **less degradation**
- **dry coal**

The Bird-Humboldt Dryer has demonstrated these advantages in coal preparation plants all over Europe. Screen life is *five to ten times* as long. Power consumption is 0.4 hp per ton. Loss of coal in the effluent averages only 3 per cent. Capacity is up to 75 tons per hour. The dewatered coal contains only 5 to 7 per cent surface moisture.

Get the facts on what this new, better, more economical coal dewatering unit can do to give you a better product and more of it per day at lower cost per ton.



SEE THE NEW

BIRD-HUMBOLDT

AT BOOTH 233,

THE COAL SHOW

or write for Bulletin

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SOUTH WALPOLE, MASSACHUSETTS

Builders of the most complete range of coal filtering and centrifugal drying equipment including

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- The Bird-Prayon Continuous Rotary Horizontal Vacuum Filter
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- The Bird Polisher for removal of fine solids or slimes from coal cleaning water

Coal Age

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Coal Show Report

If you miss anything at the Cleveland Coal Show, if you want to refresh your memory as to what was said or shown, or if you aren't able to get there, see the June issue of *Coal Age*. It will digest the papers, list the equipment shown and present a special report on the new equipment, materials and services. And for your convenience before you go, see the Coal Show preview—program and exhibits—on pp 84-92 of this issue.

Green Gloves

Any relation between these and safety? Very definitely at the southern West Virginia mines of the Semet-Solvay Div. of Allied Chemical & Dye. Green gloves, awarded for eliminating lost-time accidents, materially improved an already good safety record by providing new incentives. See the June issue of *Coal Age* for the details.

Coal for Kilowatts

Indiana provides the latest in the integration of mining operations and power production. Five miles outside Terre Haute the new plant of the Public Service Co. of Indiana gets its coal directly from the Viking mine. The design and operation of the power plant are for some other publication, but *Coal Age* will report on the mine—highly mechanized, safe and efficient—fit companion for a modern, highly efficient power plant. See the June issue.

Five-Fold

Search, and you can find room for improvement. The Hanna Coal Co., for example, went at hoist-rope wear on its 46-cu yd shovels scientifically. Results? A five-fold increase in hoist-rope life. Report scheduled for June *Coal Age*.

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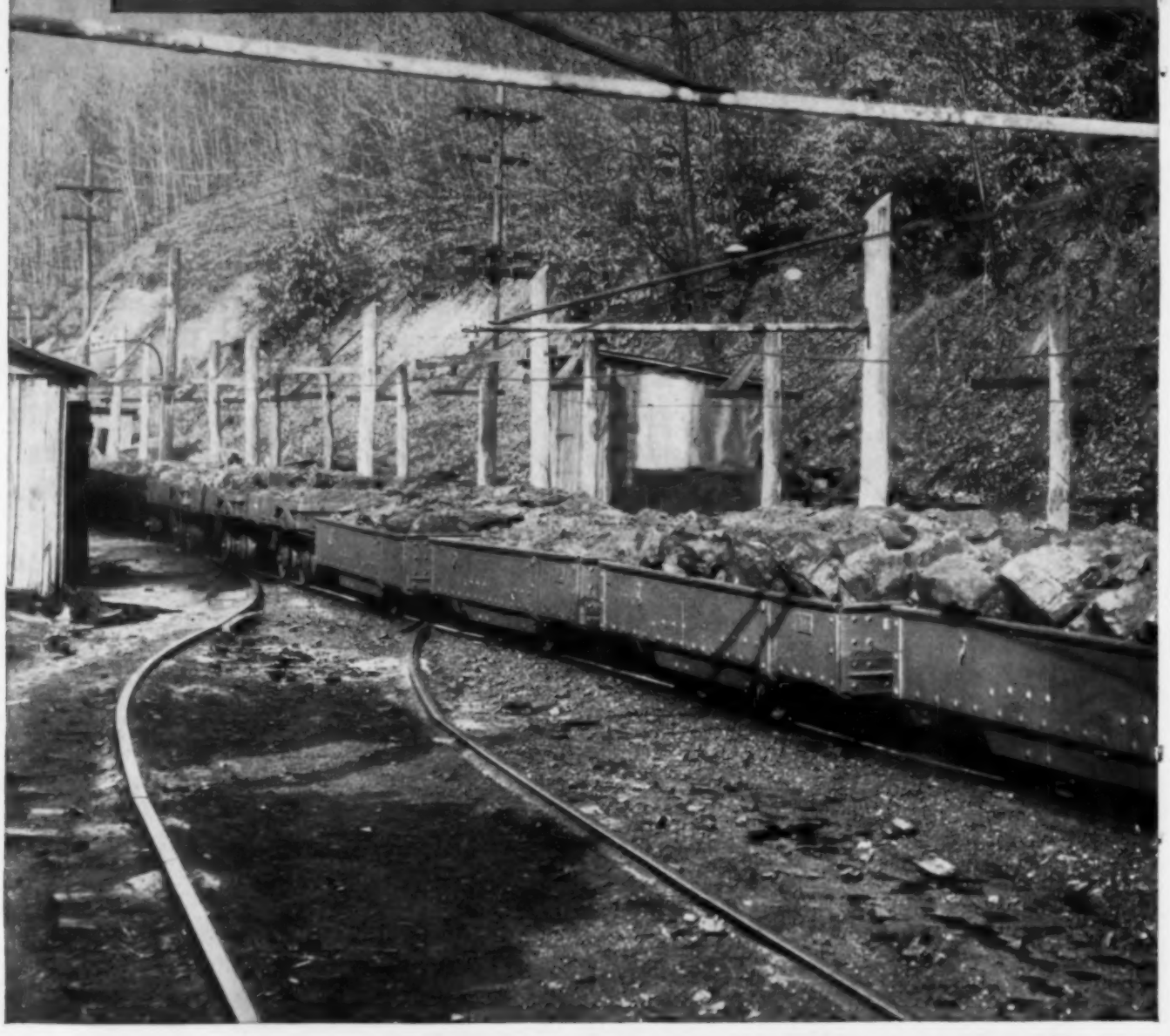

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Visit with Texaco – Booth 108 – at the Coal Show, Cleveland, May 16-19.

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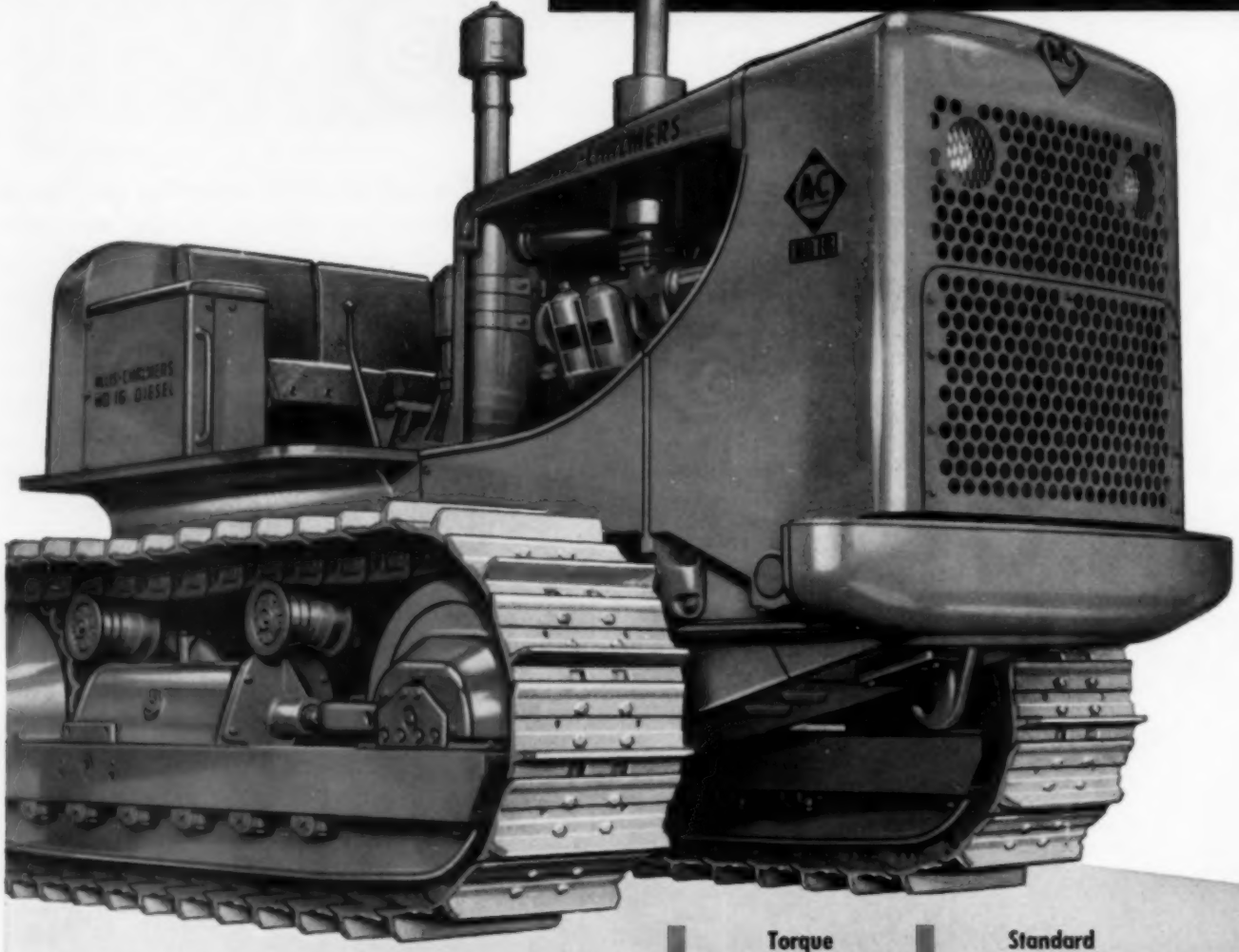

Your choice of two outstanding drives

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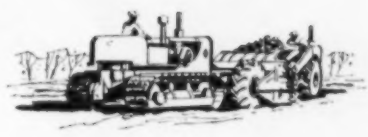

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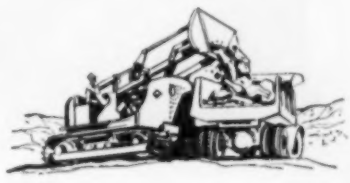

The HD-16 follows the Allis-Chalmers *advanced basic design*, with such important features as its all-steel, Box-A main frame and one-piece steering clutch and final drive case . . . straddle-mounted final-drive gears with tapered roller bearings . . . unit construction . . . simplified lubrication and service designed with *better* maintenance in mind. What's more, it is newly engineered throughout to provide big safety factors in all components . . . plus outstanding new features like the new Allis-Chalmers heavy-duty diesel engine, new "wrap-around" radiator guard, husky new transmissions, new true-dimension track, and many others.

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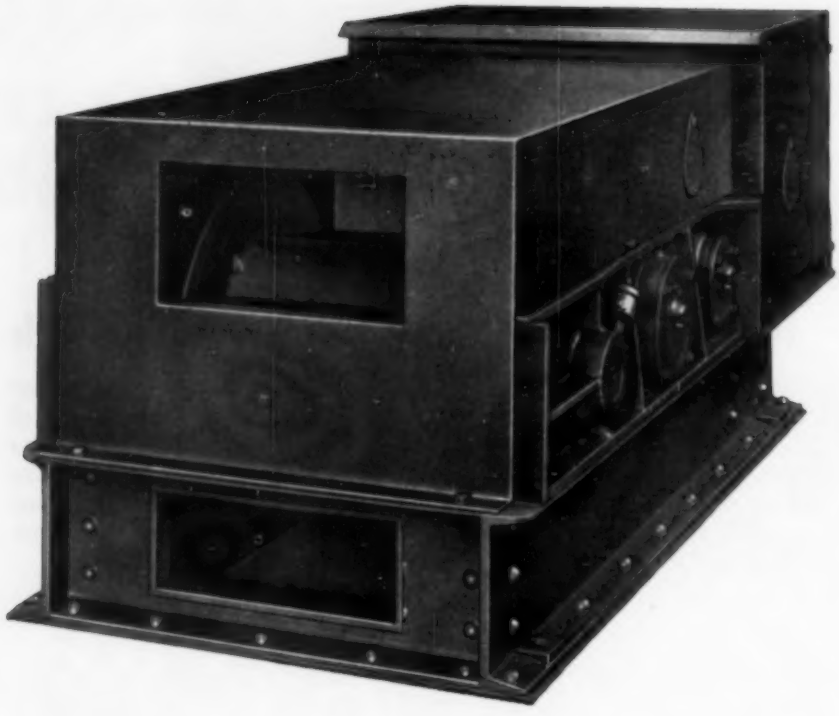

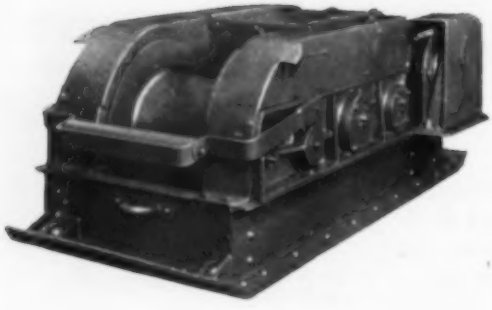

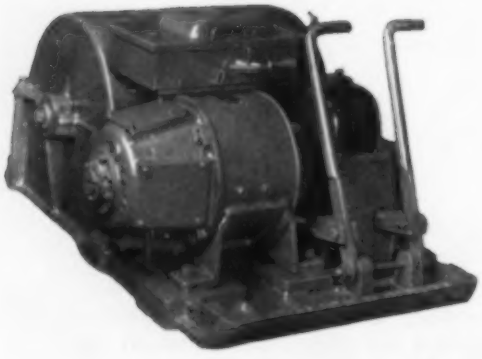

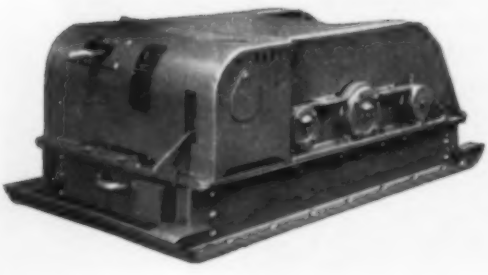

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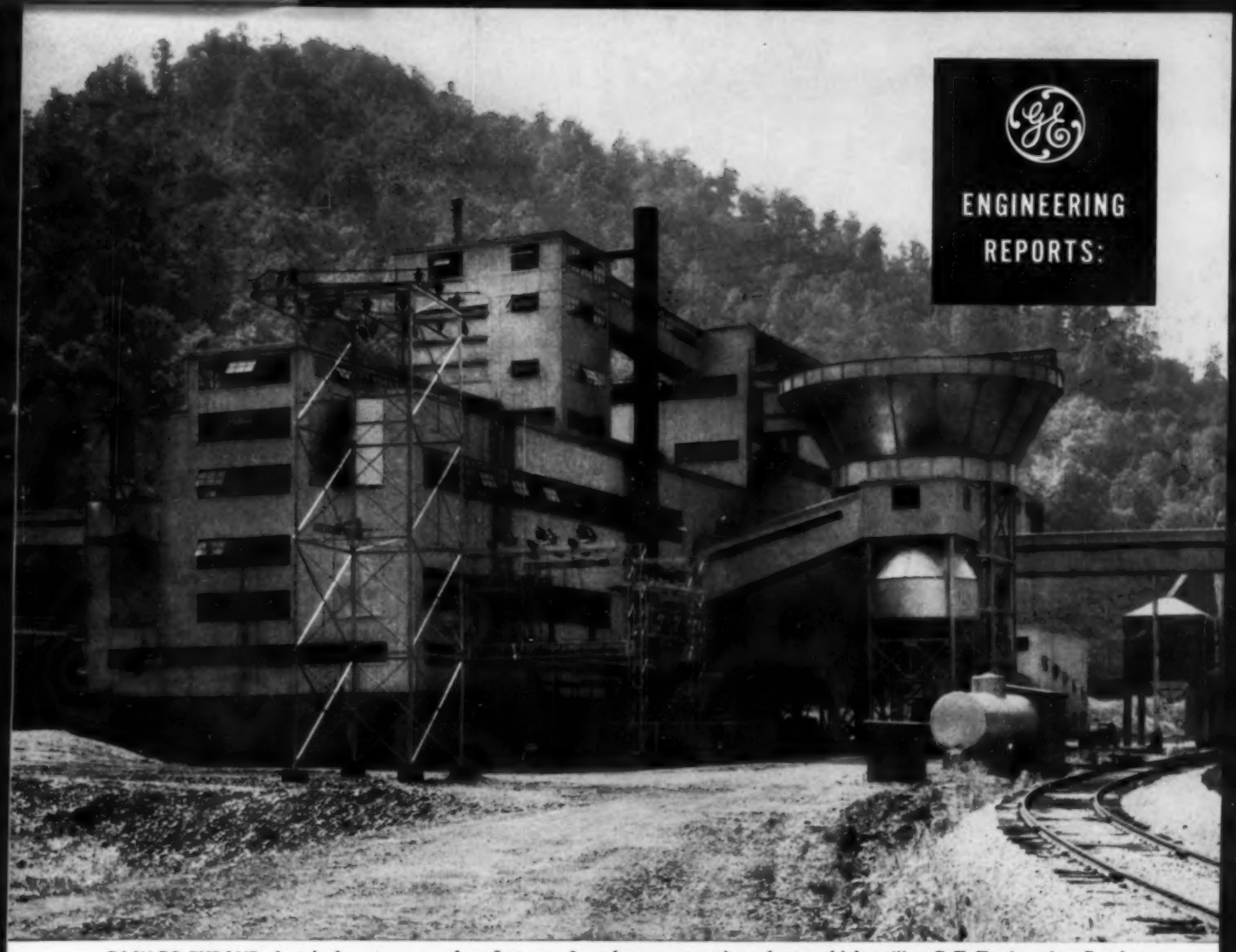

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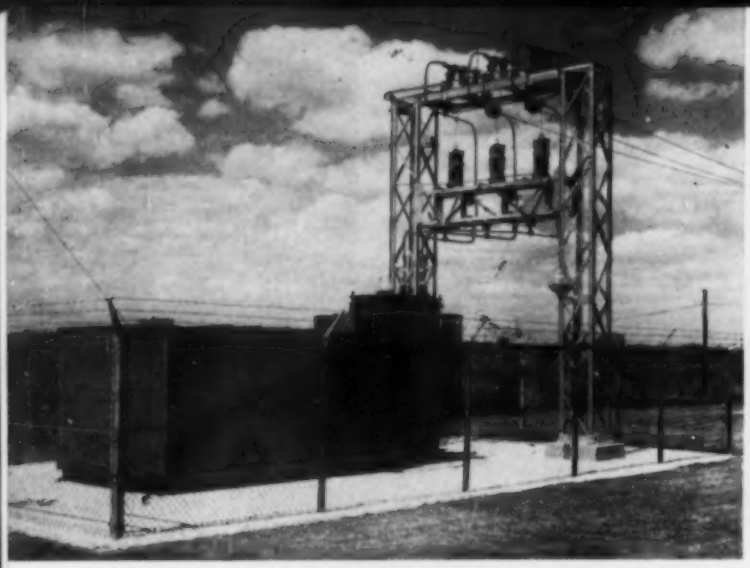
CUT YOUR OPERATING COSTS ►

GENERAL ELECTRIC



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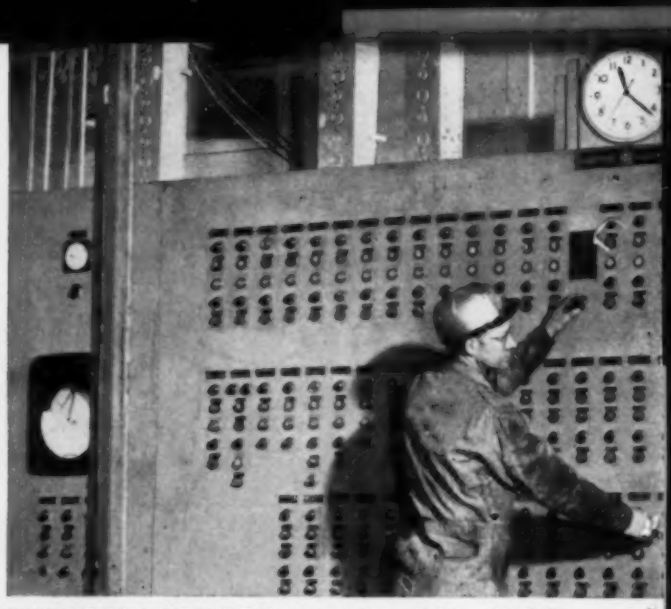

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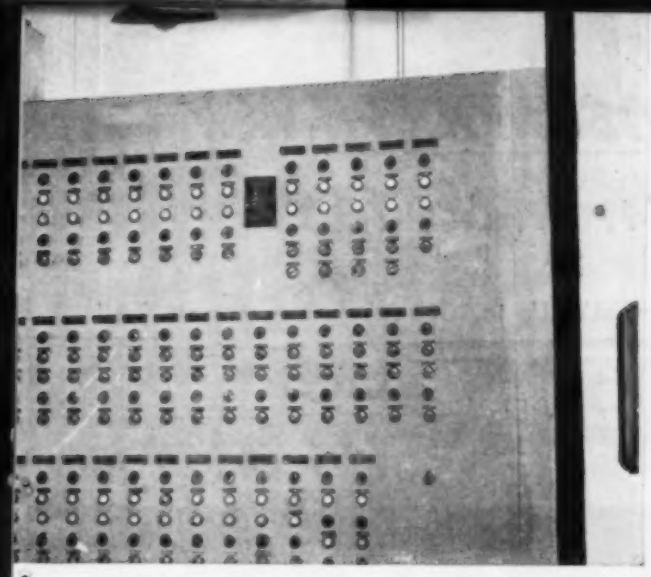

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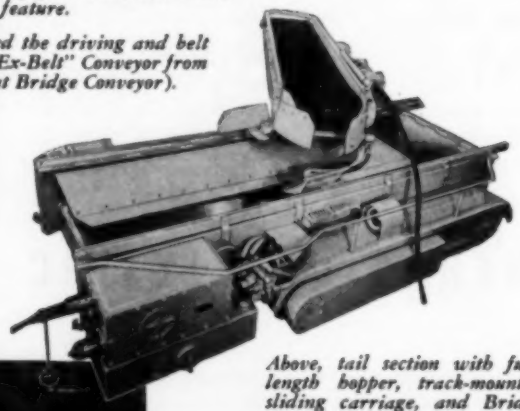
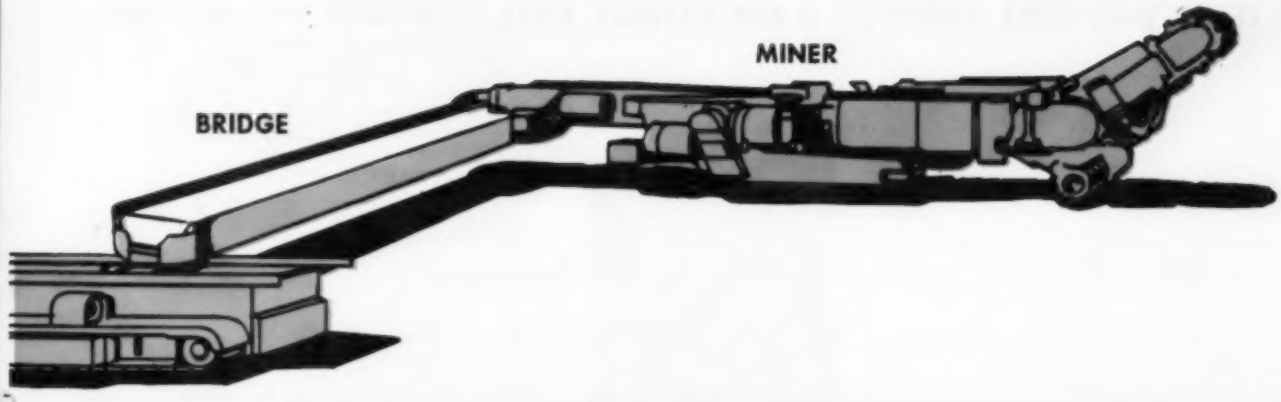
Above, the crawler-mounted driving section. At the rear is the first stand of the Joy "LIMBEROLLER" Idler system, an exclusive feature.

Left, looking up toward the driving and belt storage section of the "Ex-Belt" Conveyor from the tail section (without Bridge Conveyor).



Above, tail section with full-length hopper, track-mounted sliding carriage, and Bridge Conveyor which provides a flexible connecting link from a Continuous Miner (see drawing at top of page).

As the Continuous Miner advances while mining a room of 16-foot width, a continuous stream of coal moves away from the tail section and up the "Ex-Belt" Conveyor toward the camera. Note the perfect troughing of the belt and the smooth, steady action of the LIMBEROLLER idlers, rotating with practically no waver. Along the rib, note how the required idler stands and side rails for a 15' section of the belt stack compactly between timbers.



BELT CONVEYOR
FROM CONTINUOUS MINING MACHINES

EXTENDS OR RETRACTS 50 FT. AT A TIME UNDER FULL LOAD

With the Joy "Ex-Belt" Conveyor, once again we have broken into new ground in our continuing development of the science of mechanized mining. Once again a Joy field-proved unit gives you a real opportunity to make another important reduction in your production cost-per-ton . . . the saving you need to maintain or increase your profit margin today.

The Extensible Belt Conveyor now, *for the first time,* gives you a continuous haulage system for Continuous Miners in driving rooms and entries up as far as 1,000 feet, including breakthroughs and taking pillar on retreat. Available in 24", 30" or 36" widths, it consists of two main units: a driving section and a tail section, both of which are self-propelled on identical crawler treads. It extends or retracts 50 feet while operating under full load, and belt tension and slippage are under automatic control at all times. A 100-foot length of belt can be added or removed, as needed, in an average time of only 5.3 minutes; and the entire system can be moved over and set up for a new heading in less than 2 hours.

Perhaps most important of all, the Extensible Belt Conveyor follows the Joy tradition of simply-designed, rugged, foolproof equipment that can take the heaviest duty underground and stay on the job month in and month out. That is your final assurance of securing the favorable cost basis and production rates for which the Joy "Ex-Belt" was developed. ***Joy Manufacturing Company, Oliver Bldg., Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ont.*

WRITE FOR BULLETIN J-303

TYPICAL FIELD PERFORMANCE

In an Eastern Ohio mine, operating in 54"-60" coal (Ohio #8 seam), a Joy Continuous Miner and Extensible Belt Conveyor team permitted the driving of rooms 16 ft. wide to a depth of 600 ft. Average production rate for panels of seven rooms varied from 302.3 to 325.4 tons per shift. Average time required to change over equipment was 1¾ hours (from shut-down in one room to start-up in the next).

Consult a Joy Engineer

for a complete line of Belt Conveyor equipment available in all necessary belt widths, and various types of idlers and stands to meet any gathering or main haulage requirement.

W&D CL53628

JOY

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

SEE IT AT THE COAL SHOW... MAIN EXHIBIT HALL... DODGE BOOTH 906

FLEXIDYNE

THE DRY FLUID DRIVE

DODGE of Mishawaka Announces An Entirely New Development in Industrial Power Drives that Promises to Revolutionize Drive Performance! Every Design Engineer and Plant Operating Man in America Will Want the Following Information.

Here are the facts on how easily Flexidyne handles difficult starting problems, and gives a *new* kind of protection against shock and overloads.

While new in the United States, this drive has already been proved in thousands of installations in Europe. Dodge has redesigned it to American standards and now makes its dramatic advantages available to all industry.

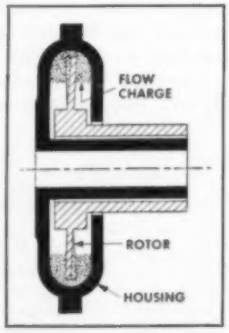
Flexidyne is a *dry fluid drive*. Its advantages over any other fluid-type drive are based on the fact that at normal operating conditions it *does not slip*.

WHAT IT IS

The Flexidyne Drive is made up of a housing, inside of which a rotor is free to turn concentrically. Between the two are fine particles of spherical steel shot, called the "flow charge," which acts very much like a fluid. The flow charge transmits power from housing to rotor.

This flow charge is easy to seal in, has a high density and can stand relatively high temperatures. The use of this flow charge makes possible a design that is simple, compact, economical, and gives outstanding new and different operating characteristics.

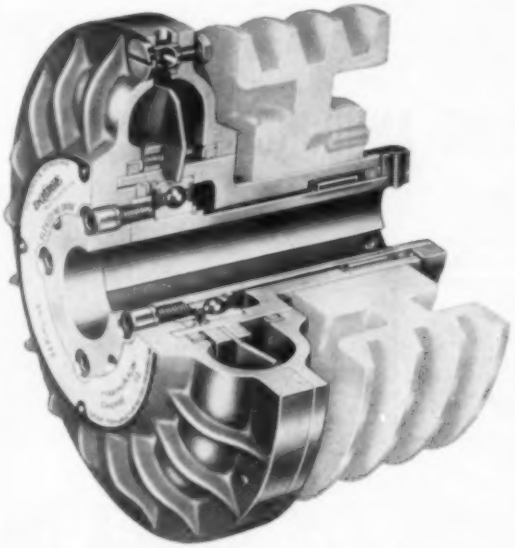
HOW IT WORKS



1. The motor is connected to the housing, and starts it turning at no load.

2. The flow charge is thrown to the circumference of the housing, is compressed by centrifugal force, and revolves with the housing.

3. The rotor, connected to the load, is started and accelerated by the friction and wedging action of the revolving flow charge.



FLEXIDYNE DRIVE (with Taper-Lock Sheave in phantom).

4. Rotor and housing reach identical speeds—the Flexidyne operates with ZERO SLIPPAGE between motor and load at normal running speeds.

5. Before overloads cause damage, the Flexidyne rotor slips relative to the housing, overcoming the friction and wedging action of the flow charge. A thermal switch (optional) automatically cuts the electrical circuit if an overload persists.

6. The amount of the flow charge determines the torque capacity.

WHAT IT DOES

The Flexidyne gives you the *exact* starting torque you need, for anything from the smoothest to the fastest start. Once the load reaches normal speed, there is zero slip, giving 100% efficiency. Also, it provides *accurate* overload protection, as it can be set to slip at any desired load. During starting and overload periods the current draw is at a minimum because with the standard Flexidyne setting the motor is never pulled down to less than 90% of synchronous speed.

All this is due to Flexidyne's completely new principle, which produces *constant torque* for a given input speed, regardless of the percentage of slip between the rotor and housing (which occurs only during starting or overload).

The Flexidyne is simple to select *off the shelf.* Each size has a standard horsepower rating and yet it is only a matter of minutes to vary the flow charge to give you your own *tailor-made torque* to suit the job.

With Flexidyne you get *uniform* performance regardless of changes in the surrounding temperature.

The Flexidyne has very long life and practically negligible maintenance. *Its simplicity guarantees its dependability.* Gas and diesel engines also benefit from all Flexidyne advantages.

Aside from Flexidyne's low first cost, low maintenance, and top efficiency, it permits the use of smaller, cheaper motors and controls with greatly reduced current demands and improved power factor. Its *smoother* starts and *gentler* overload protection avoid breakage and reduce maintenance on drives, gears, bearings and driven machinery.

FLEXIDYNE COUPLINGS

Two lines will be available—*Flexidyne Drives,* for convenient mounting directly on motor shafts and adapted for Dodge Taper-Lock Sheaves, and *Flexidyne Couplings* with Taper-Lock Bushings, for straight line drives. Several thousands of these units of French design, in capacities ranging from fractional to thousands of horsepower, are now in use in Europe. Dodge will first offer — from stock — four sizes rated at 3 to 30 hp at 1800 rpm. Other sizes will follow.

Write now for special bulletin, delivery dates and application information.

DODGE MANUFACTURING CORPORATION
3000 UNION STREET, MISHAWAKA, INDIANA

CALL *THE TRANSMISSIONEER,* your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

DODGE
of Mishawaka, Ind.

ROEBLING ANNOUNCES ITS NEW

Royal 1105 Blue

WIRE ROPE . . . 15% STRONGER THAN YESTERDAY'S GUARANTEED STRONGEST!

15% MORE STRENGTH is a whopping improvement. But translate that extra strength into terms of increased service life and you've really got something to brag about.

★ What's more, Roebling is pulling no punches on the variety of this new rope that will soon be available. You'll be able to get **ROYAL BLUE** Wire Rope in EVERY DIAMETER from ¼" to 3½"... in EVERY STANDARD CONSTRUCTION with an independent wire rope core.

★ In addition to new high strength, Roebling type 1105 wire – the finest high carbon rope wire ever produced – gives **ROYAL BLUE** Wire Rope amazing toughness and resistance to impact, crushing, abrasion and fatigue.

★ As the first step toward completely new service economy, write us for the whole story on **ROYAL BLUE** Wire Rope, or contact your distributor or nearest Roebling branch office.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 61 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1930 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

In 1935 we "told you"

"The Man with the Stick" was out . . .

and you produced better coal for more profit using the Automatic Controlled Norton Jig.

ETHEL CHILTON

See what they are doing at the leading mines—you will recognize these two famous trademarks. Blue Diamond's Leatherwood Mine No. 2, Leatherwood, Ky. and Ethel Chilton Mines at Ethel, W. Va., where 14" x 6" and 16" x 6" are successfully being washed in the only equipment that can do the job—the McNally Tromp Automatic Heavy Media Bath.

BLUE DIAMOND'S LEATHERWOOD COAL

Get Your Share of the COAL BUSINESS

FIRST CLASS
PERMIT No. 93
(Sec. 34.9, P. L. & R.)
PITTSBURG, KANSAS

BUSINESS REPLY CARD
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

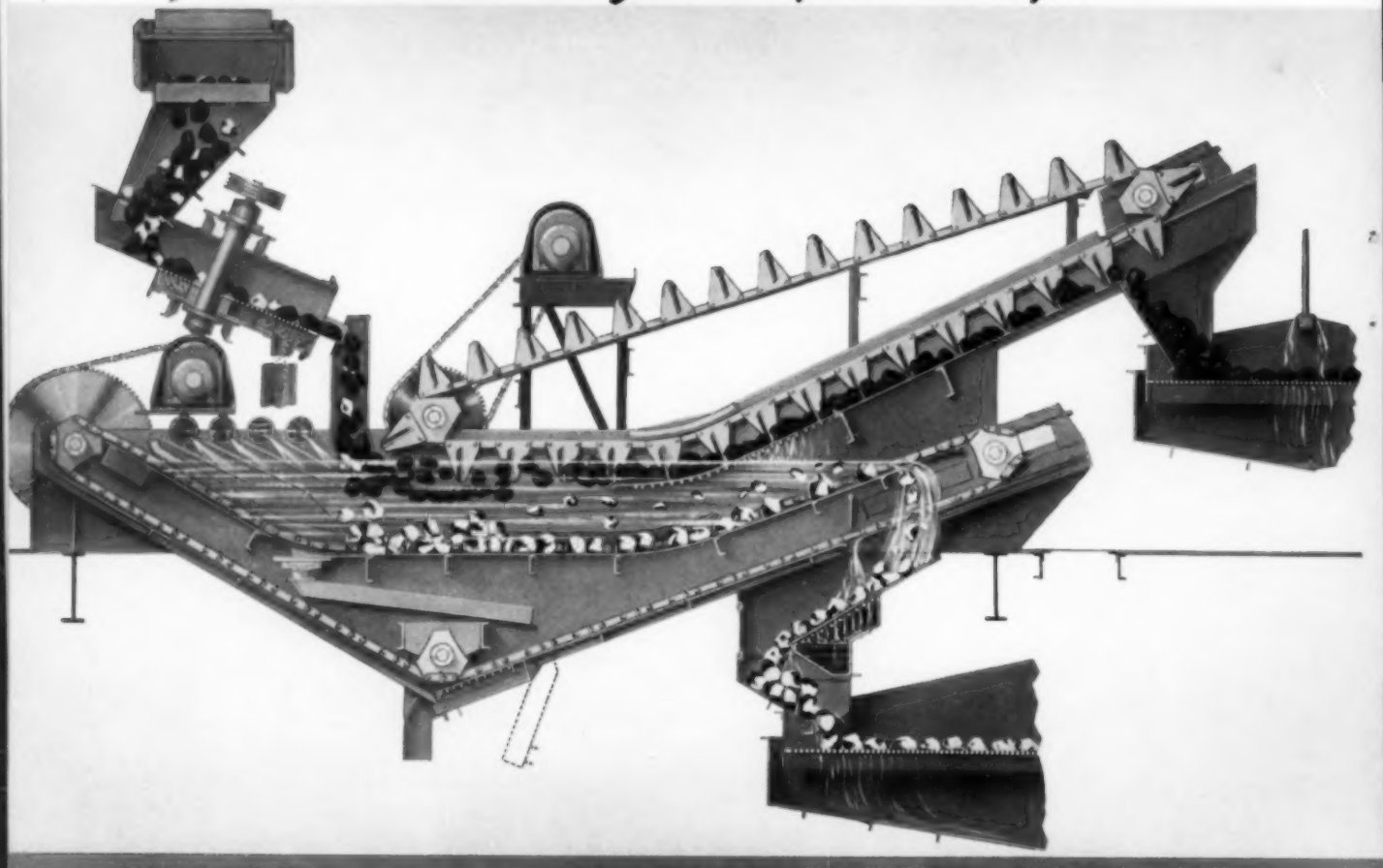
4c-POSTAGE WILL BE PAID BY—

McNally Pittsburg Mfg. Corp.
PITTSBURG, KANSAS

Here's the real, *efficient* way you can

Automatically WASH ALL SIZE COALS

from 1/8" up to 16" lump



McNALLY TROMP HEAVY MEDIA WASHER

Deliver better fuel . . . at better profits! This McNally equipment stands alone in washing lump and egg sizes from 1/8″ up to 16″ lump at laboratory efficiency. Saves costly man power—takes out all free impurities to produce premium coals consistently. In one continuous operation this McNally Tromp Heavy Media Bath separates the coal by flotation in tonnage ranges to suit your requirements.

STATE YOUR PROBLEM HERE OR ON YOUR LETTERHEAD

Send us your recommendations on how we may use the McNally Tromp Dense Media Cleaning System.

We are operating on_____seam.

We would like to wash_____x_____coal at_____tons per hour,

at our_____mine, located at_____.

Name_____Title_____

Company_____

City and State_____

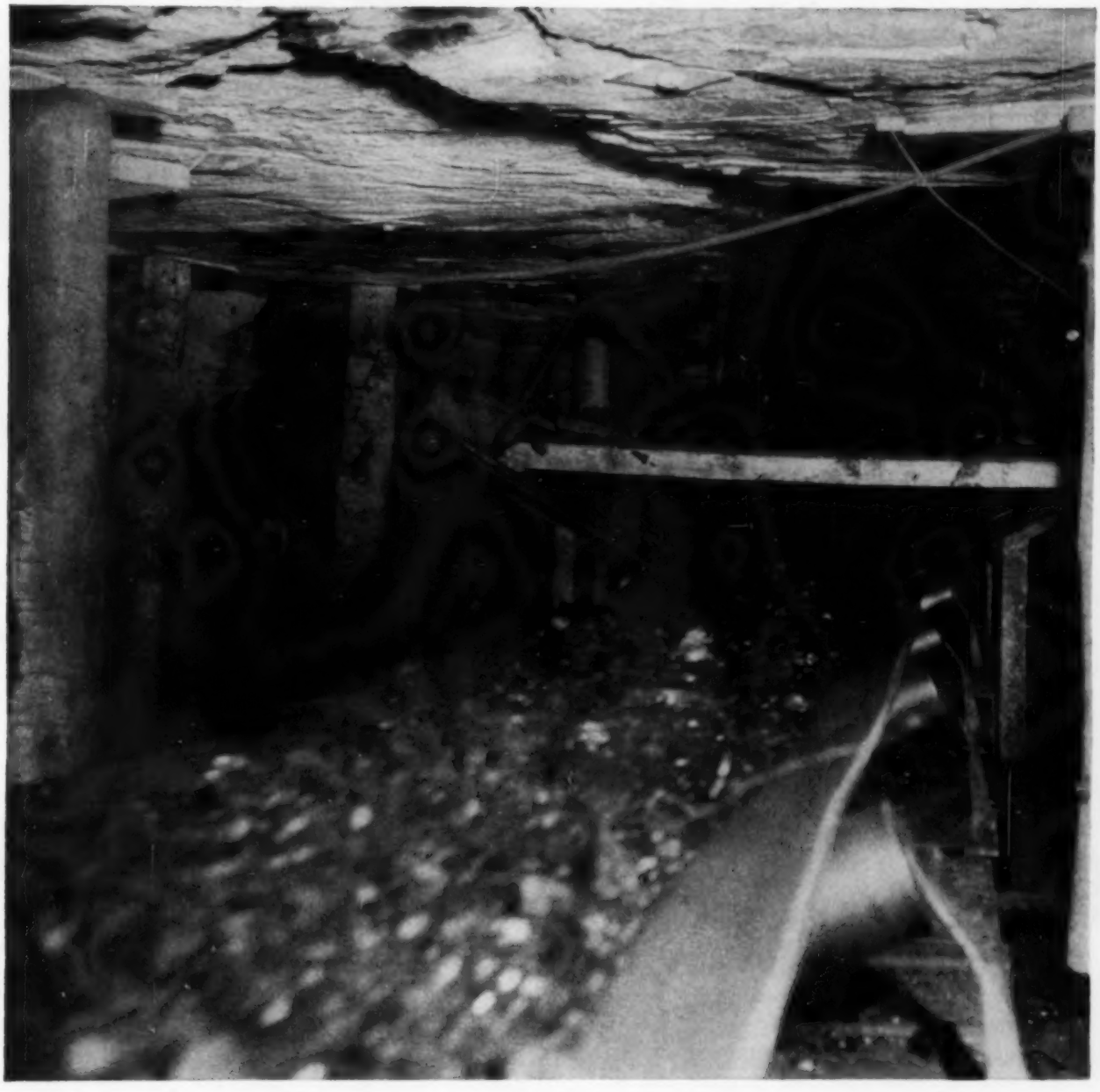
☐ **Have Sales Engineer call for further consultation.**
☐ **Mail your Bulletin No. 451.**

C

You, too, can compete in the toughest markets and stay there at a profit.

Ask

McNALLY PITTSBURG
MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL



NEOPRENE BELTS CUT OPERATING COSTS because only neoprene conveyor covers offer the *balanced* resistance to chipping, cutting, abrasion, heat, weathering, grease and oil needed for long, trouble-free performance. With neoprene, you get low operating and maintenance cost performance *plus* an important extra—mine safety, since neoprene does not propagate flame. That's why it pays to *specify neoprene*—the same tough, safe material used for jacketing *all* mine-trailing cable.

NEOPRENE

The rubber made by Du Pont since 1932

DU PONT

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Better Things for Better Living . . . through Chemistry

FREE! THE NEOPRENE NOTEBOOK

Every issue contains new illustrated case histories, interesting articles, new ways to save with neoprene. Mail this coupon today to E. I. du Pont de Nemours & Co. (Inc.). Elastomers Division CO-5, Wilmington 98, Delaware.

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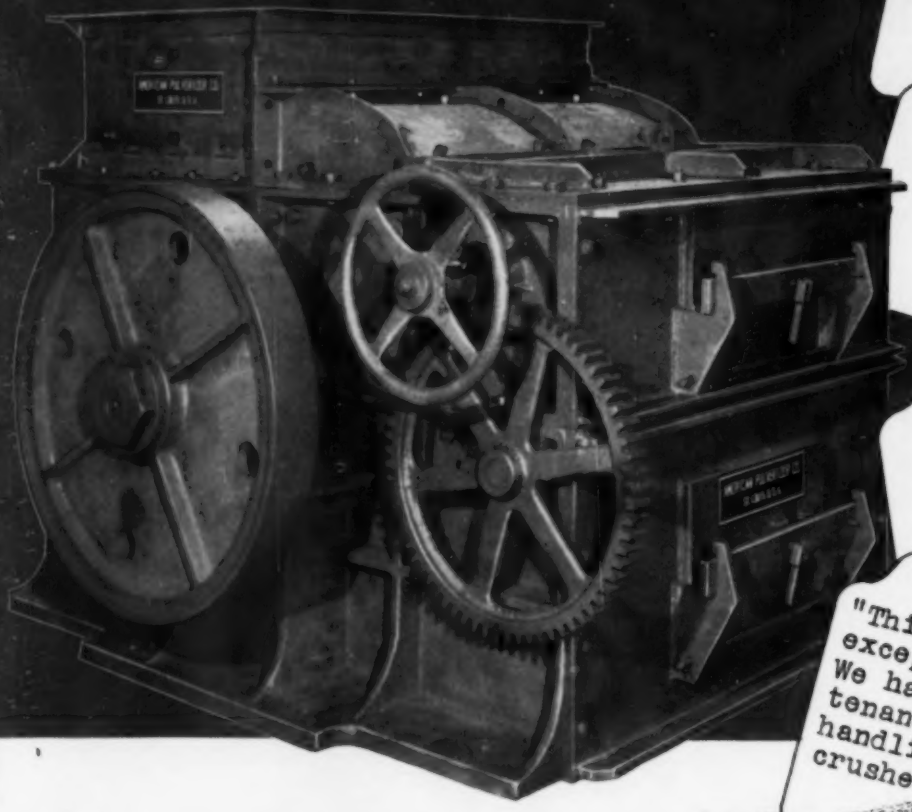
users tell us...

AMERICAN COAL CRUSHERS GIVE GREAT PERFORMANCE AT LOW COST



"This machine has crushed 175,000 tons of coal without replacement parts"

"Has given the least trouble of any machine in our power plant"

"Very dependable piece of equipment"

"A reliable and well applied unit, consistently producing a uniform product"

"This crusher has been giving exceptionally good service. We have had very little maintenance. Does a better job handling wet coal than most crushers"

"We have never done any maintenance work on the crusher. It is still in very good condition with little or no evidence of wear. The repair parts we ordered are being kept in stock for future use"

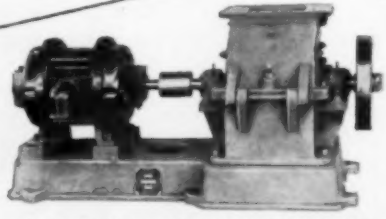
Performances in hundreds of mines, power plants and central stations have proved conclusively that American Coal Crushers can crush coal for *less than 1¢ per ton*, including depreciation, replacement parts, power and interest on original investment.

Write us today indicating your special needs in coal crushing equipment. We'll be glad to give recommendations and cost estimates.

When You Figure Cost Per Ton, the Best Answers Come From American

COAL CRUSHERS
Up to 800 TPH

SAMPLE CRUSHERS
To Suit Your Requirements



FOR LOW-COST COAL-SAMPLE CRUSHING
Model 15 x 9 American Sample Crusher for capacities up to 2000 lbs. per hr.

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 Macklind Ave., St. Louis 10, Mo.

21241

You're looking at the "Working Head" of THE HIGHEST TONNAGE-PRODUCING MINING AND LOADING MACHINE AVAILABLE TODAY – the Goodman "Boring Type" Continuous Miner

Goodman Miners are powerful, rugged machines for both low and high seams. They bore into the solid coal in continuous advance, cutting and loading up to 6 tons per minute. They are fully maneuverable, too, for any phase of development or full production work.

Patented and Patents Pending.

AT THE COAL SHOW IN CLEVELAND . . .

Goodman will exhibit a boring type miner. Don't miss seeing it along with other new Goodman equipment that will be on display.

GOODMAN MANUFACTURING COMPANY

HALSTED STREET AND 48TH PLACE • CHICAGO 9, ILLINOIS

CUTTING MACHINES • CONVEYORS • LOADERS • SHUTTLE CARS • LOCOMOTIVES • CONTINUOUS MINERS

KOEHRING COMPANY Milwaukee 16, Wis. Subsidiaries: JOHNSON PARSONS · KWIK-MIX

BIG-PRODUCTION TEAM — Loading rock, Koehring 1½-yard shovel (above) is teamed up with Koehring Dumpsters®

Measure excavators by

price per pound of lifting capacity

In analyzing shovel operation, you will find that price per pound of lifting capacity on crane rating is also an excellent measurement of excavator value.

Remember, lift capacity is *work capacity*. Obviously, the machine with the heaviest lift rating not only picks up larger crane loads — it also has more strength, extra speed and stability to handle bigger loads faster with every excavator attachment.

Check Koehring lift ratings shown below — then ask your Koehring distributor to give you the figures on price per pound of lifting capacity.

Compare for yourself:

KOEHRING MODEL	SIZE DIPPER	KOEHRING LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load)		PRICE PER POUND OF LIFT CAP.*
205 CRAWLER	½-Yd.	20,000 lbs.	30-foot boom at 10-ft. radius	?
205 ON RUBBER	½-Yd.	30,000 lbs.	25-foot boom at 12-ft. radius	?
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	?
304 ON RUBBER	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-ft. radius	?
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-ft. radius	?

Figures available on request—ask your Koehring distributor to see them.

KOEHRING HEAVY DUTY

Designed to haul the big payloads

Here is a haulway that's making a solid contribution to profit. It's a big, heavy system of big, heavy rail designed to haul heavyweight loads, today and for many years to come.

There's nothing jerry-built about this haulage system, it didn't "just grow." It was carefully planned and custom-built according to the owner's needs, with Bethlehem prefabricated track. And it shows what you can expect when you call in a Bethlehem engineer to help in modernizing your workings.

He'll go over your operation, discuss your requirements with you, then submit complete plans for your inspection. When everything looks right to you (and that means *everything*, down to the last spike and splice bar!) we'll bring the whole new layout to life in our plant to be sure of easy installation at yours. No wasted material, no needless man-hours in your Bethlehem prefabricated track system.

Lest you think this sounds like a luxury, we point out that your new prefabricated Bethlehem track system will pay for itself surprisingly soon through the savings it makes. The best thing to do is get in touch with one of our engineers. He can be helpful to you, and it will just take a call or a note to bring him to your office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM PREFABRICATED TRACK

Thermoid Hose designed specifically for use in mines

Thermoid designs and manufactures many types of hose built to give longer service and lower operating costs in a wide variety of specific applications. These 3 are ideal for rugged mining work:

THERMINE Heavy duty air hose, mandrel-built with oil resistant tube reinforced by high tensile yarn. Smooth, abrasion-resistant cover.

THERMOFLEX Mandrel-built air hose for extreme service and direct connection to compressors. Smooth, black, abrasion-resistant cover.

#325 SUCTION HOSE For heavy duty water suction service. Smooth bore, wrapped hose with heavy wire reinforcement, durable cotton duck plies.

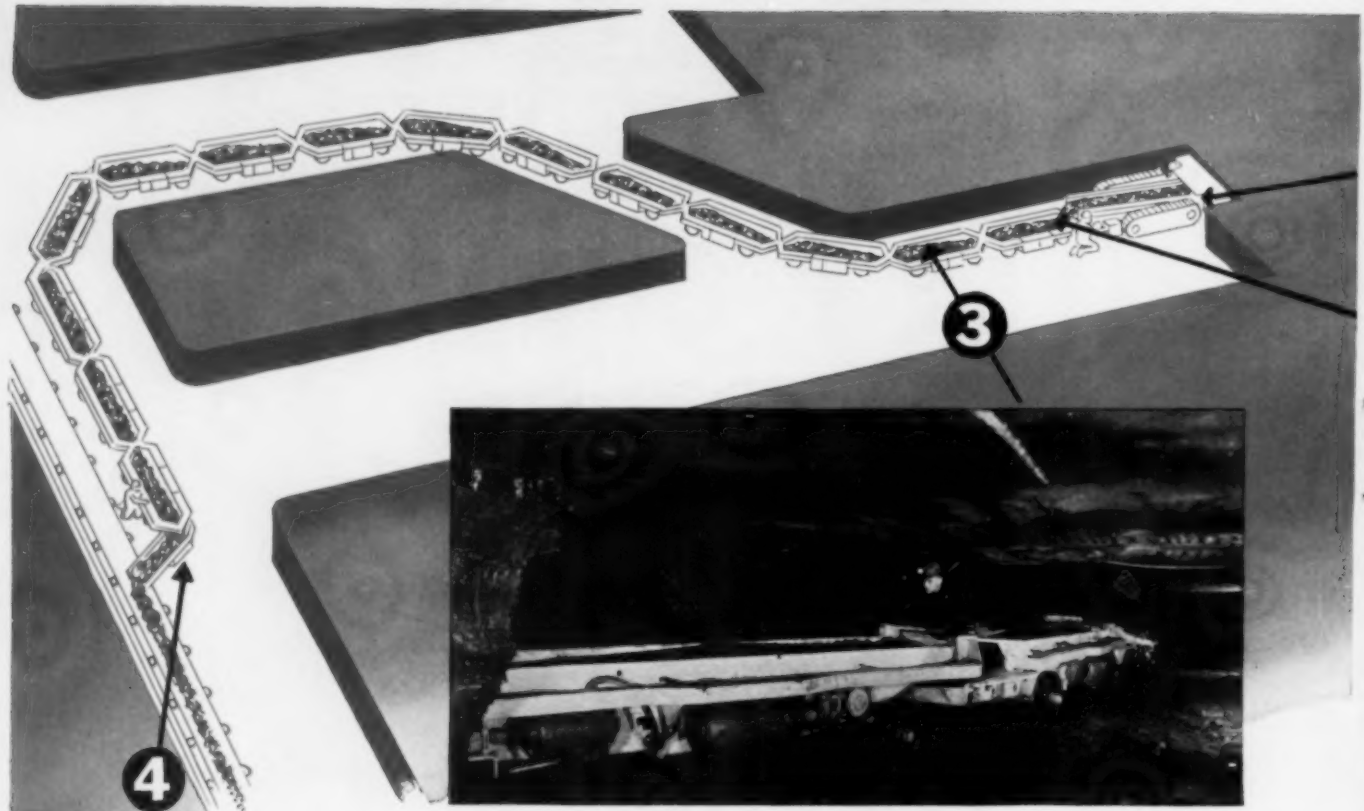
Thermoid research is responsible for new, better construction that makes Thermoid hose more durable . . . easier to handle. In addition to hose, your Thermoid Distributor also carries a complete line of Thermoid Conveyor Belting and Multi-V Belts. Call him for complete information. Or if you prefer write direct.

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

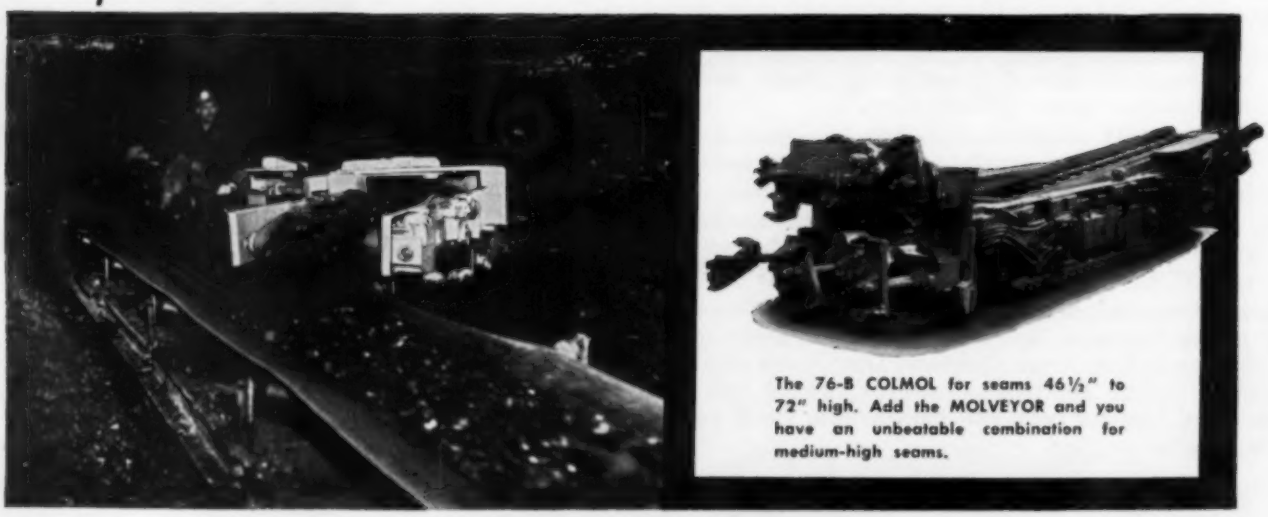
Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah



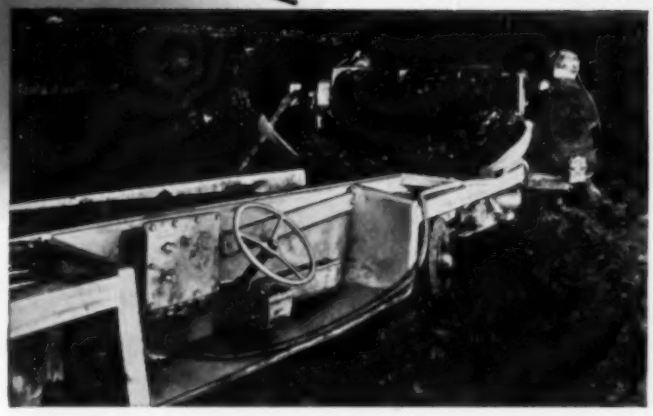
with this JEFFREY team, continuous

newly improved MOLVEYOR adds to the high-tonnage



The 76-B COLMOL for seams 46½" to 72" high. Add the MOLVEYOR and you have an unbeatable combination for medium-high seams.

The 76-AM COLMOL, available in three heights for cutting seams 38" upward. It teams with the MOLVEYOR for big tonnage in low vein coal.



means continuous

flexible haulage COLMOL . . .

When the Jeffrey COLMOL hits its 80-tons/man-shift stride, haulage becomes the only problem standing in the way of real 100% high-tonnage continuous mining. But here comes the MOLVEYOR to solve that . . . a conveyor so flexible it hauls that much coal away without interruption.

The COLMOL-MOLVEYOR team is the biggest producing, most versatile continuous mining system introduced to date. Compare it with any other combination on the market.

The COLMOL advances straight into the solid seam of coal, cutting an area the full width and height of its cutting head and to any determined room depth. Coal is mined by the boring action of cutter arms. It is carried on the COLMOL'S conveyor to the rear of the machine and into . . .

The MOLVEYOR, a string of connected belt conveyor sections mounted on wheels. Each section is 15 feet long, and in a train is capable of reaching 300 feet or more from the face to the main haulage system. The MOLVEYOR advances on its own power right behind the COLMOL, trailing perfectly, thanks to unified steering. From entries it "snakes" around room necks, into rooms and through cross-cuts, carrying back an uninterrupted flow of coal.

The Coal Really Rolls

When the coal starts rolling with this system, it keeps on rolling. The COLMOL produces up to 80 tons per man shift . . . and the MOLVEYOR hauls it away with no waiting for intermediate transportation.

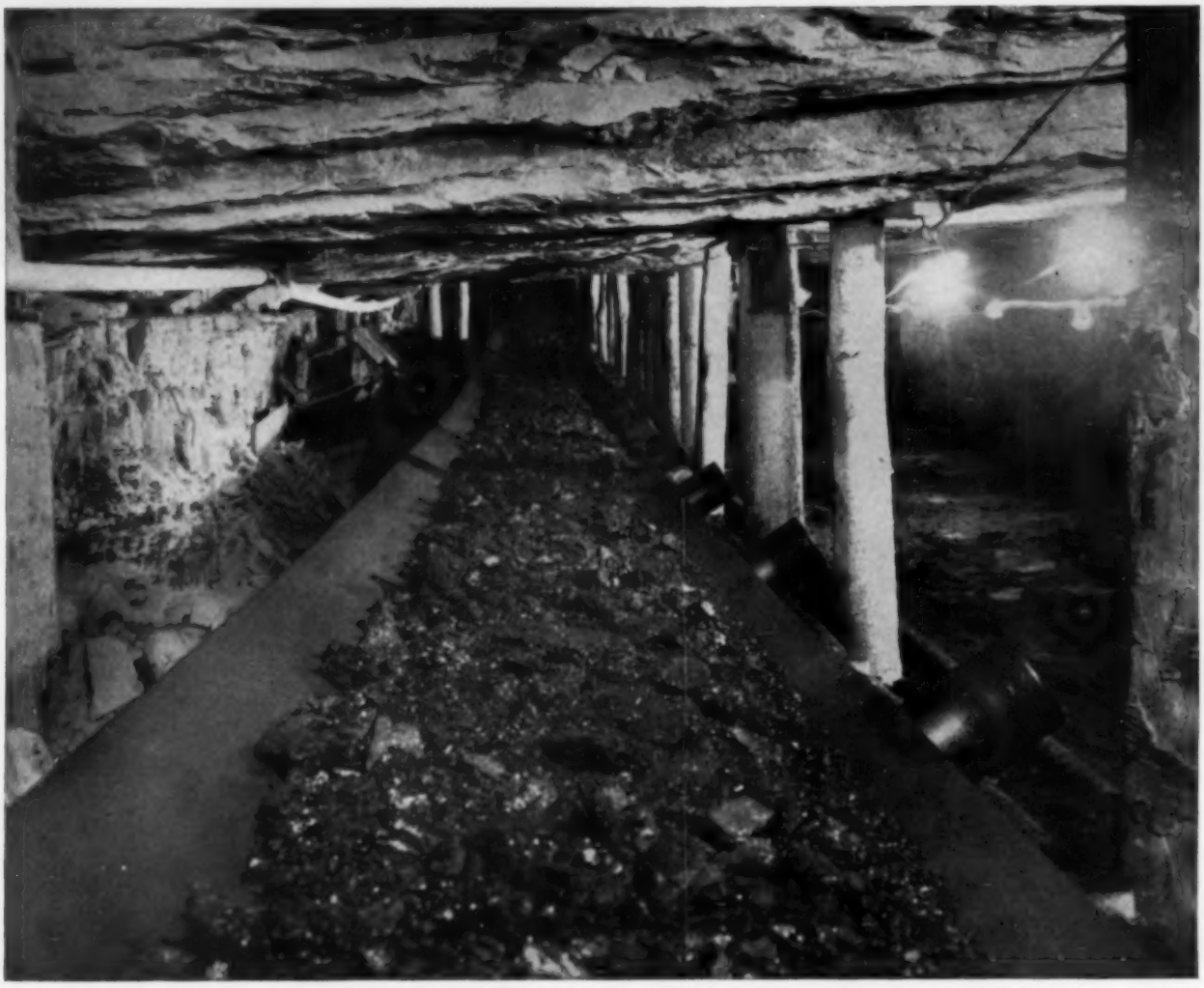
Remember this! No other continuous-type mining machine can produce more coal than the COLMOL in mines where the Jeffrey unit can work . . . and no other connecting conveyor is as flexible as the MOLVEYOR.

With Jeffrey continuous *means* continuous . . . and real high-tonnage continuous mining calls for the COLMOL-MOLVEYOR combination.

JEFFREY ... for continuous mining...see us at the Coal Show

THE JEFFREY MANUFACTURING COMPANY • COLUMBUS 16, OHIO

Barnes and Tucker Co. reports: **"Almost 10 miles of belting reinforced with Du Pont 'Cordura' helped increase production, cut expenses"**



NOW Du Pont "SUPER CORDURA" makes belts even stronger

Eight separate belting operations—nearly 10 miles of belts—are used by the Barnes and Tucker Co. of Pennsylvania in mining 4,000 tons of bituminous coal daily. And all of this belting is built with Du Pont "Cordura"* High Tenacity Rayon, for extra strength, less stretch, better troughing and training.

The company reports that the belts reinforced with "Cordura" have been an important factor in raising production from 2,500 to 4,000 tons daily. Manufactured by the Boston Woven Hose and Rubber Co., the belts currently operate 14 hours each working day. Performance has been outstanding, with little maintenance necessary. What's more, the use of conveyor belts saves the expense of cutting higher openings to lay track and run coal cars to the digging area. And the low stretch of Du Pont "Cordura" reduces expensive downtime for take-up and repair.

And now—there's an even stronger, tougher reinforcement available for conveyor belting—Du Pont "Super Cordura"* High Tenacity Rayon. A product of Du Pont research, this exceptionally strong rayon offers top performance under the most rugged conditions of use. Write us for the names of suppliers. E. I. du Pont de Nemours & Co. (Inc.), Textile Fibers Dept., Wilmington 98, Del.

*REG. U. S. PAT. OFF.

DU PONT *Super Cordura*
High Tenacity Rayon

DU PONT
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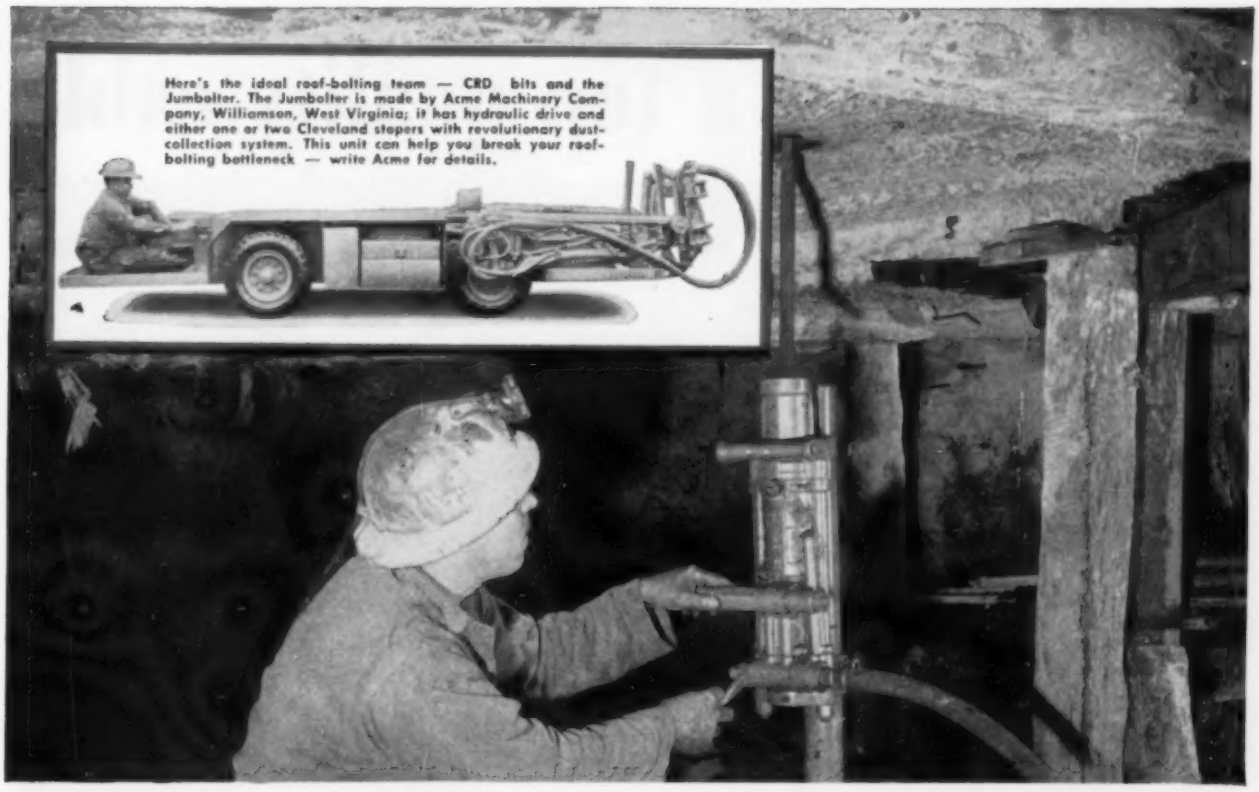
BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*


Here's the ideal roof-bolting team — CRD bits and the Jumbolter. The Jumbolter is made by Acme Machinery Company, Williamson, West Virginia; it has hydraulic drive and either one or two Cleveland stopers with revolutionary dust-collection system. This unit can help you break your roof-bolting bottleneck — write Acme for details.

The Price Alone of CRD one-use bits can lower your drilling costs

. . . and they are made and backed by CLEVELAND Rock Drill

How do Cleveland CRD one-use bits save you money? It's just plain economics. You see, the price of CRD bits on an average, is less than one-half that of a multi-use bit. In fact, the price of a CRD bit comes close to matching the cost of reconditioning a multi-use bit.

So the price alone of CRD one-use bits can help you cut your drilling costs. But there are other reasons to use CRD bits, too.

Faster Drilling Speed — Special offset gauge feature, which permits the use of thinner wings and a steeper reaming angle, greatly reduces binding and provides ample clearance for cuttings. Result is a free, fast-cutting, chiseling action that gives you greater drilling speed.

Less Drill-Steel Breakage — The method of attachment used with the CRD bit eliminates threads on the drill rod. Since a drill rod is only as strong as the root diameters of its threads, the tapered threadless CRD design provides longer drill-steel life — reduces drill-steel handling and reconditioning costs.

Lower Rock Drill Repair Costs — Because the CRD bit design reduces binding in the hole, there is less strain on the rotation parts of your rock drills. Rifle bars, rifle nuts, and chucks last longer. You get more drilling done at lower cost.

Since no special equipment is needed for reconditioning bits or threading rods, you owe it to yourself to try a can of CRD bits. They're ideal for roof-bolting. A short trial will give you first-hand information on the ability of these bits to cut drilling costs in your property, as they have in so many others.

Bulletin RD-29 gives detailed information. A copy is yours for the asking — just write for it.

SPECIFICATIONS

Mines everywhere cut drilling costs with CRD DETACHABLE DRILL BITS
4-Wing Type — Center Hole — Side Hole

Series "A" Bits For series "A" drill steel connection on any steel. Best suited to ⅞" steel.	1¼	Aluminum	Series "B" Bits For series "B" drill steel connection on any steel. Best suited to 1", 1⅛", and 1¼" steel.	1⅛	Orange
	1⅜	Pink		1½	Green
	1⅜	Deep Green		1⅝	Yellow
	1⅜	Brown		1⅝	White
	1½	Grey		1¹¹⁄₁₆	Black
	1⅝	Maroon		1¾	Red
	1⅝	Deep Blue		1¹³⁄₁₆	Blue
				1⅞	Tan
				1¹⁵⁄₁₆	Plain
				2	Pink
				2⅛	Maroon
				2¼	Aluminum

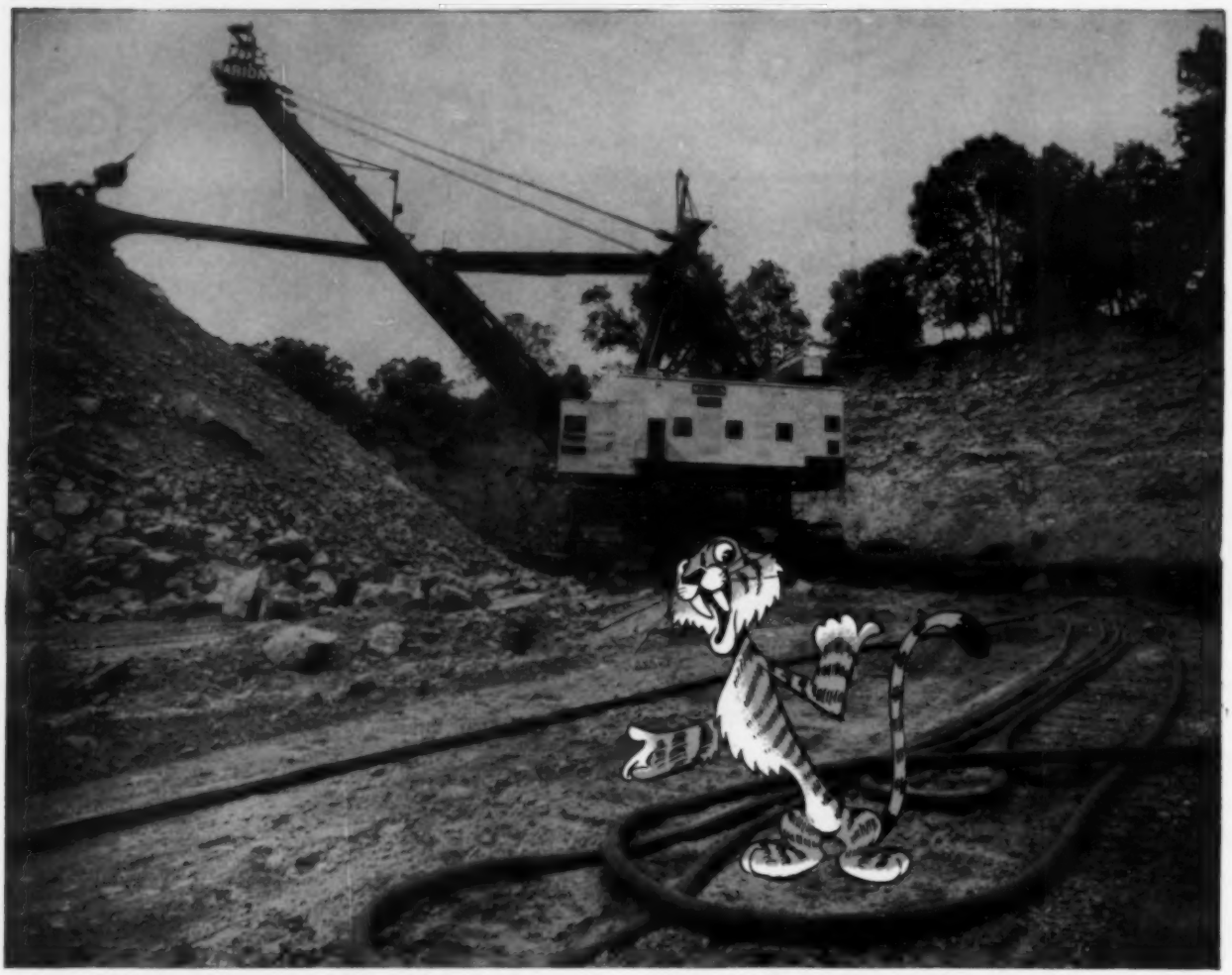
Cans are labeled showing size of steel socket, gauge of bit, and color.

CLEVELAND ROCK DRILL DIVISION
Westinghouse Air Brake Co.

12500 BEREA ROAD
CLEVELAND 11, OHIO

RD-61

They needed a top quality cable



THE 18-CUBIC-YARD SHOVEL moves a lot of overburden in a hurry. It is supplied with 7500 feet of 3-conductor 1/0 Tiger Brand Amerclad.

HERE IS THE MINE HEADQUARTERS. Wash tower is at center. Notice conveyor system at right that goes to power station over the hill.

like *Tiger Brand* for this high production strip mine

HERE IS A PORTRAIT of the 45-cubic-yard shovel that has removed most of the overburden at this mine.

If you take a ride out near Zanesville, Ohio, someday, you'll spot the new Muskingum Mine—probably the most modern strip mine in the world. It supplies coal for the new 400,000 kw Muskingum River Plant of The Ohio Power Company, part of the American Gas and Electric System.

The big 18 and 45-cubic-yard electric power shovels operate day and night through sun, rain or snow. And when you consider the eye-popping cost of lost production time, it's easy to see why these shovels need the most dependable power cable on the market. At this mine, it's 100% Tiger Brand Amerclad.

The cable is always exposed to foul weather and accidental abuse. It often stretches for more than a *mile* from switchgear to shovel take-up reel. Yet, after more than 2 years on the job, the Tiger Brand Amerclad is in perfect condition without sign of wear.

If you need a cable that can *take it* . . . if you want cable for a power shovel, dredge, mine locomotive, welding machine or a heavy-duty electrical hand tool—you'll get more for your money if you specify Tiger Brand Amerclad. Drag it through puddles, over sharp rock; spill gasoline or oil on it and expose it to sun and ozone. Tiger Brand will still give you service you never thought possible. *Send the coupon.*

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

A STANDARD TIGER BRAND CABLE FOR EVERY SPECIAL JOB!

paper & varnished cambric cable	shovel & dredge cable
asbestos wire and cable	mold cured portable cord
aerial, underground & submarine cable	machine tool & building wire special purpose wire & cable

—SEND THE COUPON—

American Steel & Wire Division
Room FE-55, Rockefeller Building
Cleveland 13, Ohio

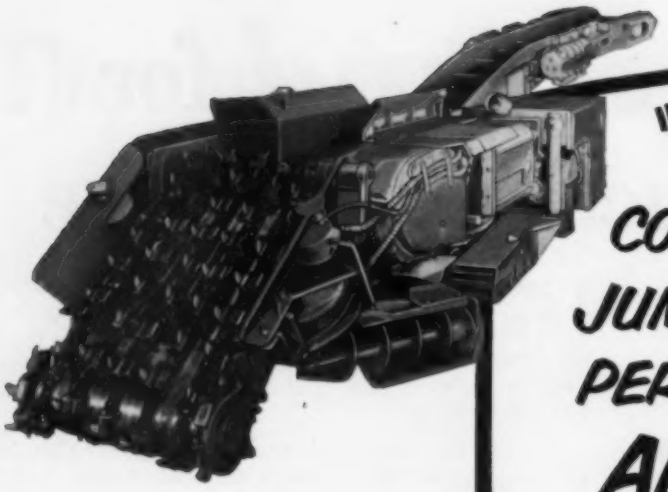
☐ Please give me more information about Amerclad.
☐ I'd like to talk to your representative.

Name .....
Firm .....
Address .....
City ..... State.....

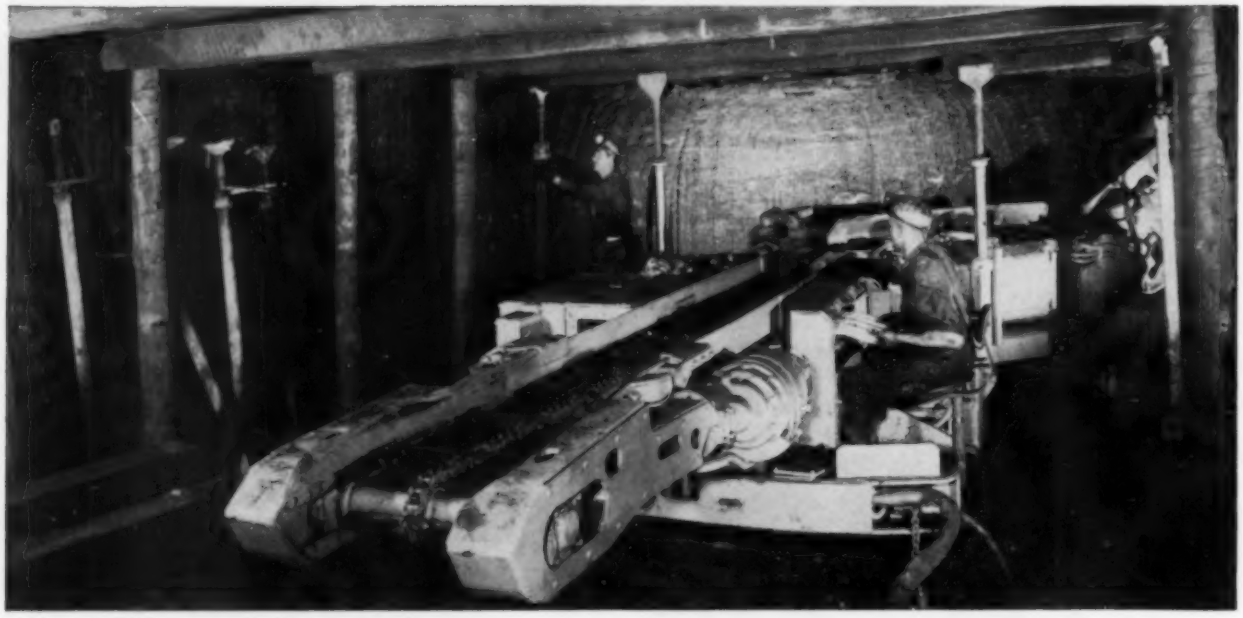
USS Tiger Brand **ELECTRICAL WIRE & CABLE**

USS

UNITED STATES STEEL



"THIS JOY 1-CM CONTINUOUS MINER JUMPED PRODUCTION PER MAN PER SHIFT ABOUT 40%!"



You Can't Argue With Results That Increase Your PROFITS

During a regular month of operation in a West Virginia mine, a Joy 1-CM-2 Continuous Miner teamed with two Joy 10-SC shuttle cars unloading on belt conveyors produced an average of 53.8 tons of raw coal per man per shift.

That represented an increase of approximately 40%! What could YOU do with something like that to bolster your profit margin?

Joy Continuous Miners and other modern mining equipment can give you the cost advantages you need. The 1-CM Continuous Miner is built for heavy-duty, high-tonnage operation in 52" coal or higher. The 3-JCM Miner, only 34" high over-all, is built for similarly high efficiency in lower seams. Both are flexible, fast-tramming units.

With either of these continuous mining machines, Joy Extensible Belt Conveyors are now available to give you *the first truly continuous haulage* in the industry. ● Whatever your mining problem may be, we have the answer for you . . . let us help you work it out. ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Consult a Joy Engineer

W&D CL5550

JOY

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

STAYS STABLE ...Hot or Cold!

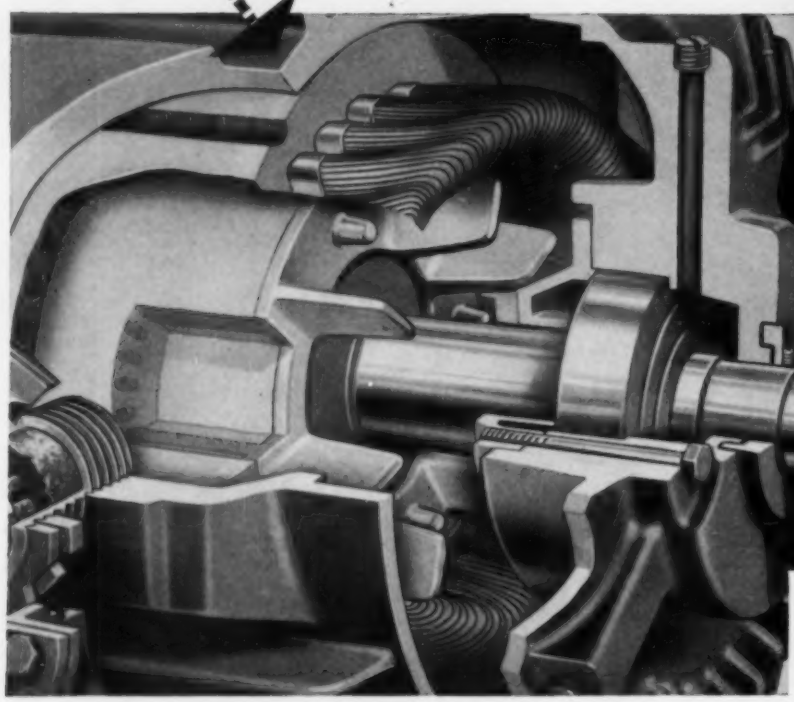
Sinclair JET LUBRICANT won't thin out at high temperatures. It maintains lubrication at frigid temperatures. This superior product stays put on heavy exposed gears and circle tracks. It resists wash-out, throw-out and drip.

JET LUBRICANT saves money, too, because it lasts longer . . . reduces lubricant consumption . . . helps to lower power consumption. No heating is required to make it usable direct from its container.

There are *more* reasons why the right grade of JET LUBRICANT and other Sinclair products can improve your operations. Why not let a Sinclair Lubrication Engineer help solve *your* lubrication problem. *There's no obligation.* Contact your local Sinclair office or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N.Y.

SINCLAIR JET LUBRICANT

Get Both bearing features



ALLIS-CHALMERS Totally-Enclosed Fan-Cooled MOTORS

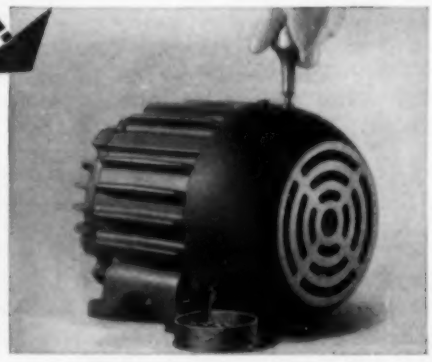
fully enclosed and protected

The bearing cap is held tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, keeps grease from the interior of the motor . . . retains an ample supply within the bearing enclosure.

At the outer side of the bearing, double labyrinth seals keep grease in, also keep dirt out. What's more, large grease reservoirs act as additional dirt traps.

. . . yet easy to grease

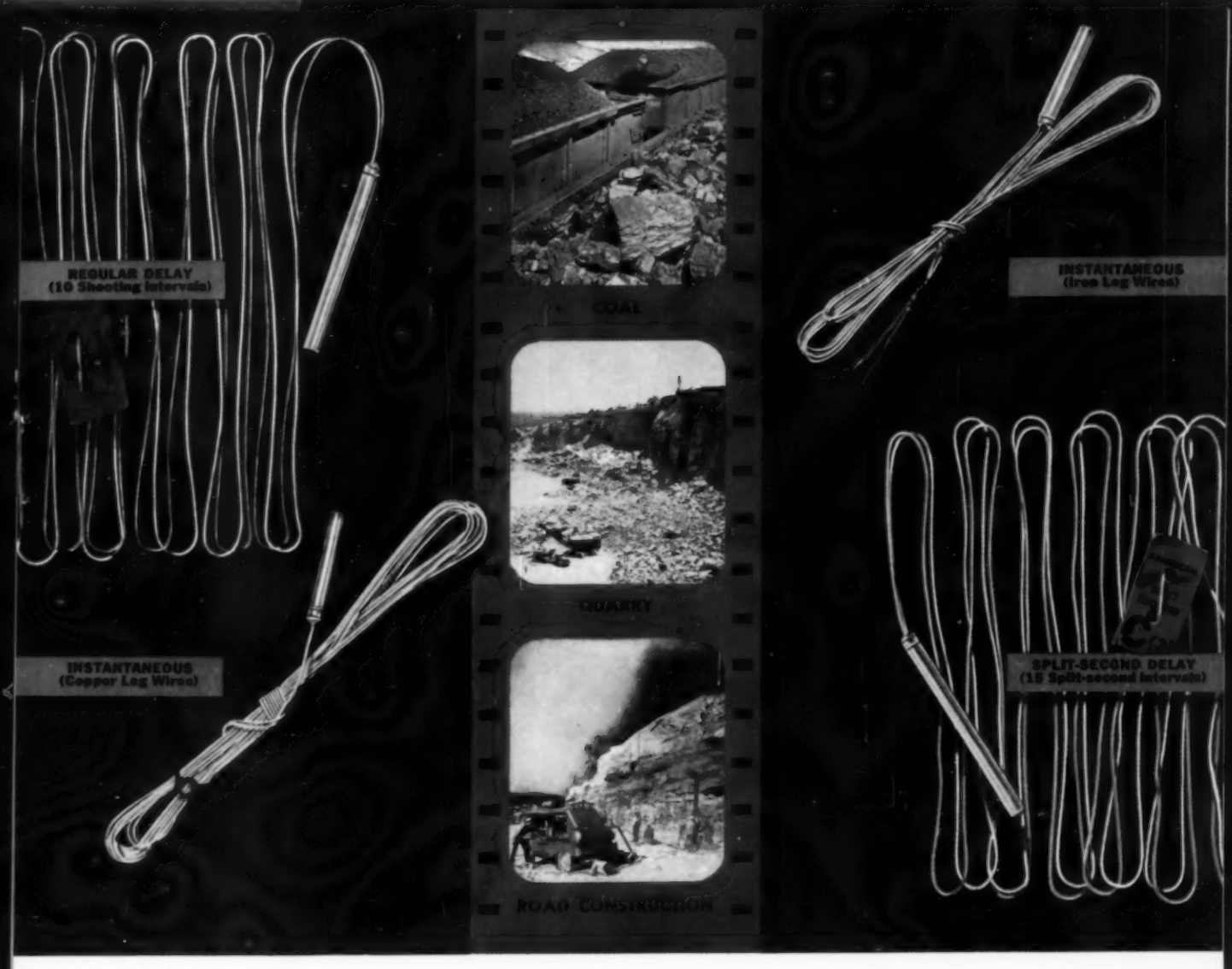
You can lubricate the bearings without dismantling the motor. Pipe-tapped holes in the bearing housings at three points provide both means for inserting new grease and a means of flushing out old grease.



Look for the extra bolts on the end housing . . . the sign of greater value. Ask your Allis-Chalmers representative or Authorized Distributor to show you a cutaway section of this maintenance-cutting design. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7225.

A-4609

ALLIS-CHALMERS



Call your shot... then call for American Electric Blasting Caps

...for American makes a cap for every type of blasting

That's right, you call your shot—instantaneous, regular or split-second delay—in coal mines, in quarries or on construction jobs. Then use American Electric Blasting Caps, for American makes the *right* cap to set your shot off dependably and economically.

And American Electric Blasting Caps also offer these positive advantages:

Choice of Delays—10 regular delay periods and 15 split-second delay periods meet virtually every timing requirement.

Timing Accuracy—the finest timing periods are produced for exact planned shooting.

Detonation Strength—more than enough to detonate most all insensitive dynamites.

Superior Insulation—five separate coats of Organosol insulation give unsurpassed electrical and strength properties.

And they're color coded for fast, sure identification.

The American Line:

High Explosives	Electric Blasting Caps
Permissibles	Instantaneous
Blasting Powder	Regular delay
Blasting Caps	Split-second delay

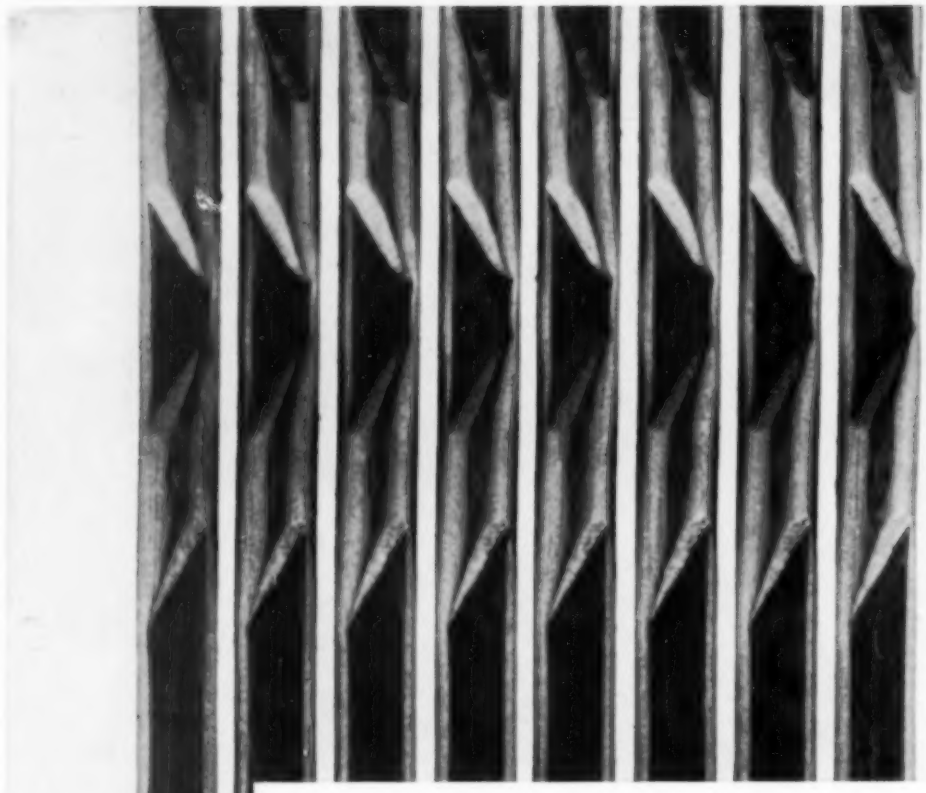
Blasting Accessories

If it's American, it's dependable.

AMERICAN CYANAMID COMPANY
EXPLOSIVES

AMERICAN Cyanamid COMPANY
EXPLOSIVES DEPARTMENT
30 Rockefeller Plaza, New York 20, N. Y.

Sales Offices: Latrobe, Pa., Pottsville, Pa., Scranton, Pa., Maynard, Mass., St. Louis, Mo., Bluefield, W. Va.



Introducing...

NEW Hendrick Wedge Wire

Now! With the addition of new Hendrick Wedge Wire, Hendrick rounds out its line of screens for the best in efficient, low-cost screening, sifting, dewatering and filtering operations. Ideal wherever it's highly important for screen openings to be minutely fine, Hendrick Wedge Wire is also available with a RIFFLE TOP profile for faster, better dewatering.

RIFFLE TOP Wedge Wire not only reduces caking, but it also has a high degree of accuracy and rigidity. For further information on Hendrick Wedge Wire's free clearance, rugged mechanical and lateral strength, maximum load carrying capacity, percentage of open area and long wearing life, write or phone your nearby Hendrick representative.

★ VISIT our Booth 1209 at The 1955 Coal Show May 16 to 19.

Hendrick
MANUFACTURING COMPANY
41 DUNDAFF STREET, CARBONDALE, PA.
Sales Offices in Principal Cities

SEE OUR CATALOG IN SWEET'S

Perforated Metal • Perforated Metal Screens • Wedge Slot and Hendrick Wedge Wire • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids

Bucyrus-Erie 88-B Shovel Design Increases Digging Power, Digging Speed, Digging Life

For sustained high output in heavy-duty service, here's an excavator that will meet your demands fully — the Bucyrus-Erie 4-cu. yd. 88-B. Three important advantages contribute to the 88-B's high production performance: superior quality construction that stands up under digging stresses; front-end design that applies power efficiently; and overall machine balance that means smooth operating control. Illustrated here are some of the benefits you get; for the *full* story see your nearest Bucyrus-Erie distributor.

MORE DIGGING POWER

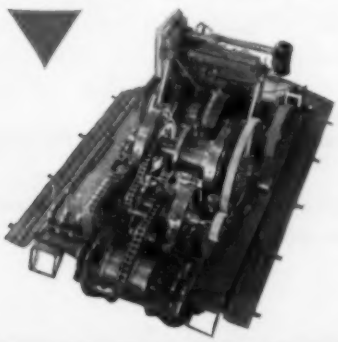
New 88-B positive twin rope balanced crowd system automatically helps operator to proportion speeds and forces properly between hoist and crowd . . . provides greater digging force. Powerful diesel engine is equipped with torque converter drive.

FASTER DIGGING SPEED

Dig, swing, and dump motions are superbly balanced by Bucyrus-Erie Individual Design. There is no overdippering, underpowering, or excess weight to prevent the operator from getting the exact responses he wants. Clutches are engaged and brakes set by full air control, not just air assist.

LONGER DIGGING LIFE

Neat, compactly arranged deck machinery is real evidence of outstanding engineering. Parts are simple yet strongly built, and are easy to get at for routine maintenance. Power is smoothly, quietly transmitted by the most direct route through anti-friction bearings.



To meet *your* job conditions, you can take your choice of three crawler mountings — standard with flat ends, long with tapered ends, or long with flat ends. Four A-frames are offered: standard high and low frames, and power-controlled high and low frames. Front-end equipment for crane, clamshell, dragline and stripping shovel operations is available. Power boom hoist is standard equipment; an independent friction-type boom hoist is also available at extra cost. 138E55C

BUCYRUS ERIE
South Milwaukee Wisconsin

1880 75 1955
YEARS OF SERVICE to Men Who Shape the Earth

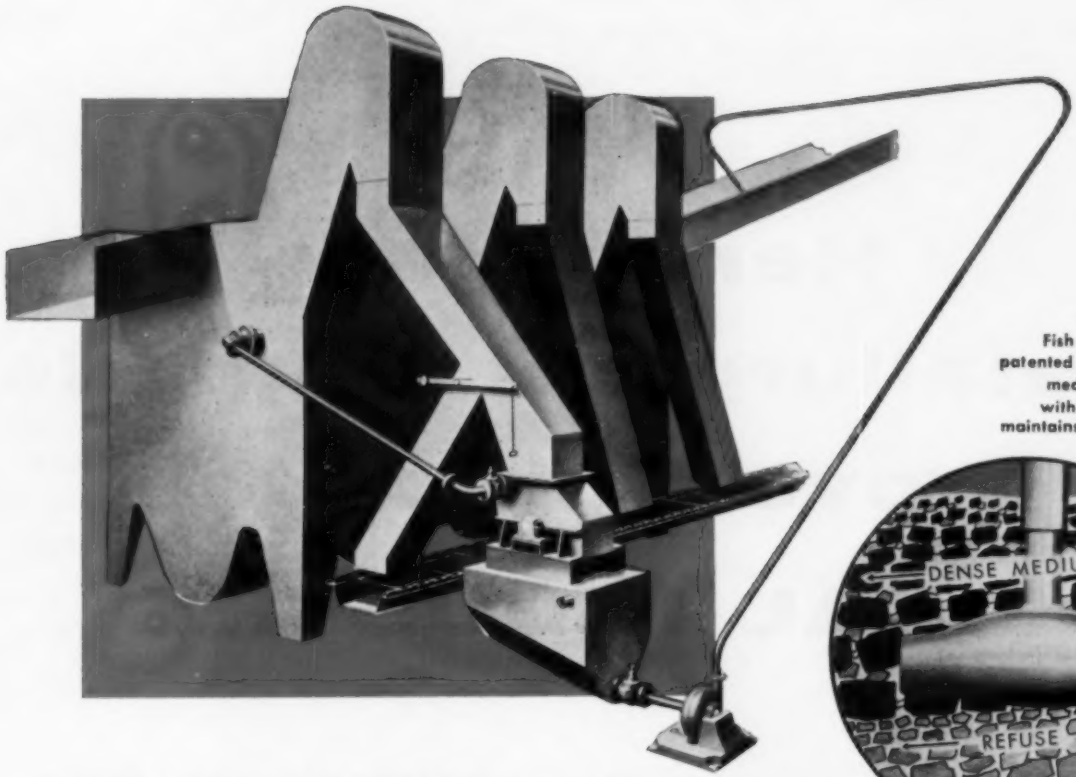
Wire Rope at Work—Installed at an Eastern bituminous mine, these big wire ropes lift nine-ton skips up a two-compartment vertical shaft. The skips are loaded approximately 500 ft below the surface, then hoisted in 40 seconds to the dumping point in the headframe. All in all, the hoist accounts for approximately 600 trips per day, lifting more than 5,000 tons of run-o'-mine coal.

In a schedule like this, involving almost constant operation, there is little leisure time for the ropes. The busy cables need strength, stamina, high resistance to bending fatigue. To insure top performance, the management long ago standardized on Bethlehem Purple Strand, and regularly specifies 1¼-in. 6x25W. The ropes are always Form-Set (preformed), and lang lay has been found most suitable.

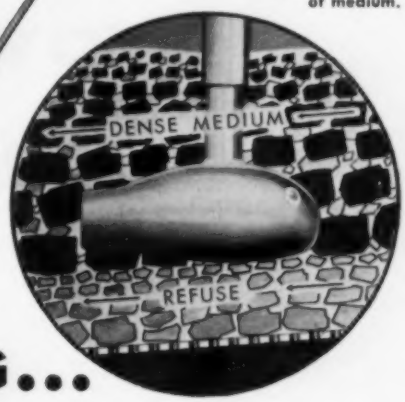
Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

MINING • CONSTRUCTION • PETROLEUM • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING

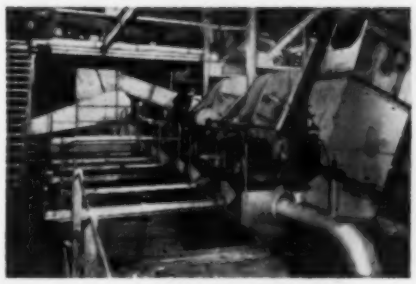


Fish Float, a Jeffrey patented device, regulates medium volume and withdrawal of refuse, maintains specific gravity of medium.



DENSE-MEDIUM JIGGING...
when separation is really tough

NOW . . . clean 8" to 100-mesh coal in the same jig! This revolutionary Jeffrey "float-and-sink" process uses bone from raw coal itself as medium . . . separates coarse and fine sizes simultaneously. More than 20 Jeffrey dense-medium plants are now in operation, handling some of the world's toughest separation jobs—and with high efficiency. Any Jeffrey multiple-compartment jig can be adapted to this process.



BONE MEDIUM—ideal material closely approaches properties of a liquid. No cost for medium . . . no royalties.

FINE, COARSE SIZES SEPARATED SIMULTANEOUSLY—Downstroke separation effectively cleans all sizes. No necessity for pre-screening jig feed.

HIGH EFFICIENCY—Recovery of coal of specified quality usually above 99.5%.

SIMPLE MEDIUM CIRCUIT—Jig recovers its own medium and maintains proper density. No auxiliary equipment required except conveyor to return medium.

NO VERTICAL CURRENTS IN MEDIUM—Falling refuse cannot cause destructive upward currents in a falling medium.

MINIMUM END-WALL EFFECTS—means cleaner products . . . a Jeffrey patented development.

LOW GALLONAGE OF CIRCULATING WATER—Only enough water used to transport coal . . . cuts costs . . . recovers fine coal better . . . reduces cost of settling system.

VARIABLE GRAVITIES OBTAINABLE IF NEEDED—by thinning bone medium with water.

HIGH UNIT CAPACITIES—Pulsating medium minimizes refuse entrainment, gives top capacity.

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

Columbus 16, Ohio

sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED . . . *IT'S A JOB FOR JEFFREY!*

Here's How Metallurgical Methods Prove Out for the COAL INDUSTRY

Bulletin No. 7100 will tell you how proven metallurgical methods can be applied. Write for your copy.

Modern mining methods have resulted in increased coal production and economy for the coal producer. However, these new techniques brought many problems to the cleaning plant too.

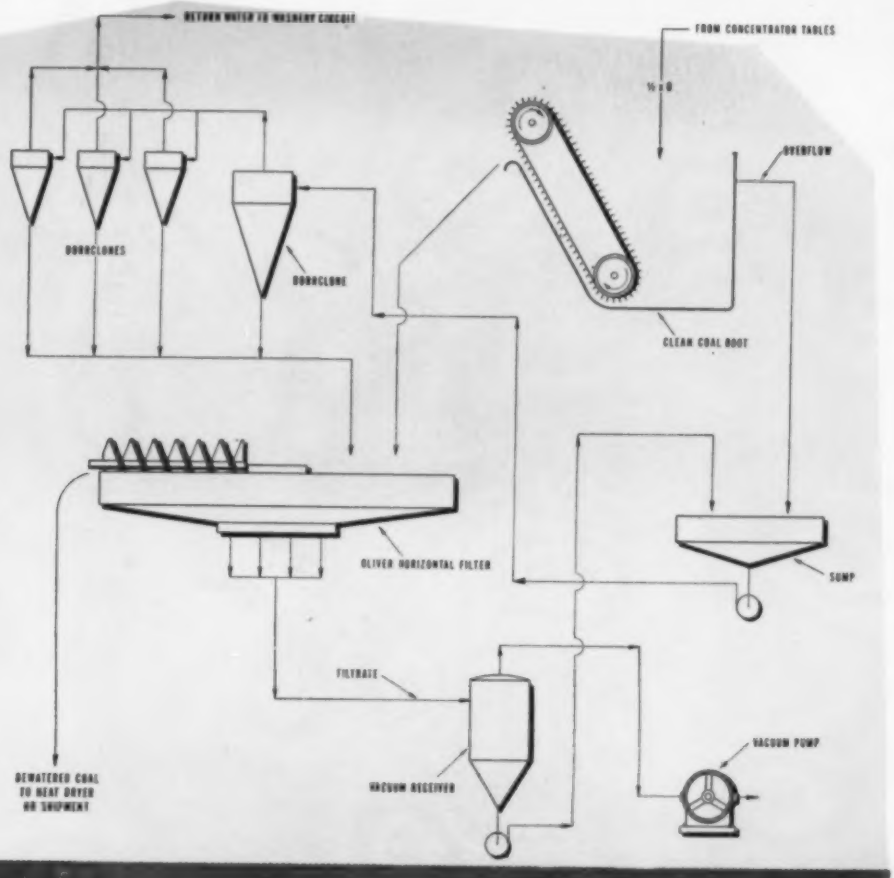
Dorr-Oliver metallurgical methods and equipment are solving such problems as dewatering table feed, fine coal and refuse . . . desliming for coal recovery . . . slimes thickening and water clarification . . . pumping and metering underflow from Thickeners and Hydroseparators.

To put these proven metallurgical methods to work for you, make use of our diversified experience in coal cleaning. Just drop a line to Dorr-Oliver Incorporated, Stamford, Connecticut.

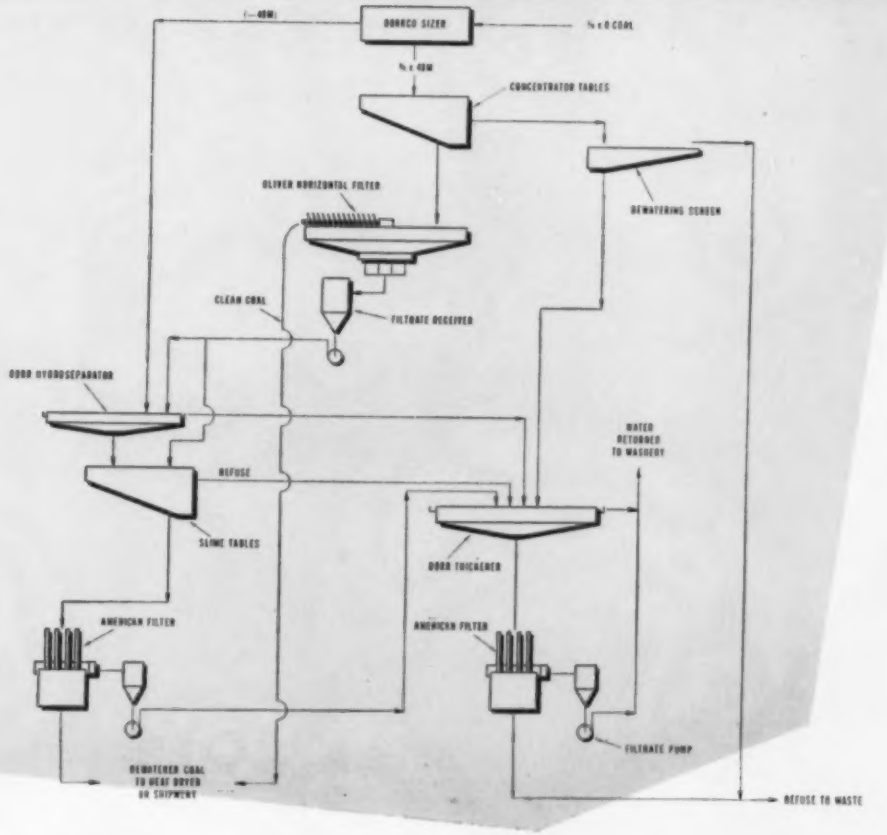
We'll be glad to discuss your problems at the Coal Show, Booth 731

DORR-OLIVER
INCORPORATED
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
STAMFORD • CONNECTICUT • U.S.A.

FINE COAL CLEANING FLOWSHEET NO. 1



FINE COAL CLEANING FLOWSHEET NO. 2

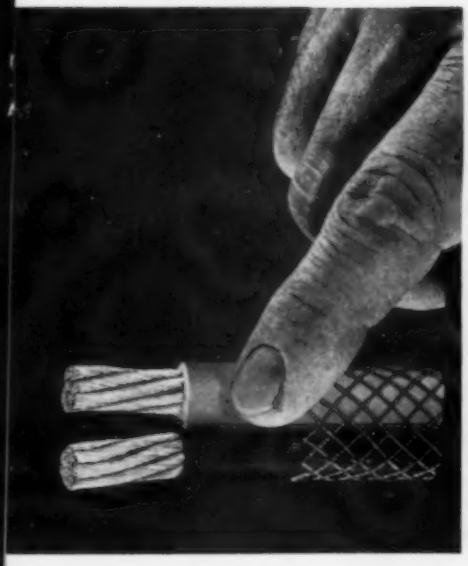


The two flowsheets are hypothetical only . . . designed to illustrate typical points of application of Dorr-Oliver equipment.

Here shown in actual use, Anaconda's new Securityflex Shuttle Car Cable withstands toughest mine conditions.

Anaconda introduces a

NEW SHUTTLE CAR CABLE



1 **New neoprene insulation compound** gives Securityflex cable physical toughness on the INSIDE as well as the outside.

2 **New stranding of grounding conductor** prevents broken wires — assures continuity of ground, fewer failures, fewer splices, less production loss.

3 **New nylon Anti-Short Breaker Strip*** helps give Securityflex amazing crush resistance. This construction minimizes short circuits between conductors even under heaviest impact.

New insulation, new stranding, new breaker strip, and jacket reinforcement mean longer, safer, more economical service than ever before from twin parallel cable.

"Heart trouble" causes most mine cable failure today. The jacket may look fine. But inside . . . in the heart of the cable . . . the story may be different. Insulation damaged — even punctured — or conductors broken.

Based on painstaking failure studies of all makes of cable, Anaconda has further improved its Securityflex* Shuttle Car Cable.

1 Rugged high-grade neoprene insulating compound greatly increases resistance to puncture, flame and crushing — a contributory cause of failure in mine cables.

2 Improved stranding of grounding and power conductors prevents broken wires—assures continuity of ground for the life of the cable.

3 Unlike other types of shuttle car cable, ANACONDA Securityflex with patented nylon breaker strip increases short circuit protection — more so than ever before. Nylon reinforcement in jacket also adds to cable strength and prevents wicking of moisture.

Actual mine tests show that this new construction greatly increases cable life because of fewer failures, therefore less down time. Improved Securityflex is another achievement of Anaconda mine cable engineers in the never-ending search for better, more reliable cable for mine use.

Ask the man from Anaconda for full information on new Securityflex Shuttle Car Cable. See your Anaconda distributor or write: Anaconda Wire & Cable, 25 Broadway, New York 4, N. Y.

*Trade Mark 55333

ANACONDA®

MINE CABLE

Visit CARDOX at the Coal Show!...

Booth 2000

See NEW CARDOX Equipment!

Hear How It Will Help You to Cut Costs!

- We'll have engineers on hand to tell you of new CARDOX equipment now being introduced —of methods that are boosting profits and efficiency in other progressive mines.

We'll be looking for you— BOOTH 2000

AIRDOX

THE CHEAPEST MEANS KNOWN FOR FACE PREPARATION

New semi-portable AIRDOX model will be shown

New models and designs now give AIRDOX even greater scope—put the cost-cutting advantages of AIRDOX within reach of more mines.

AIRDOX Compressors, part of a complete AIRDOX installation that is "paying off" in better mine operation at lower cost.

Wherever it is in use AIRDOX has proved that it helps to:

- **REDUCE FACE PREPARATION COSTS**
- **INCREASE LOADABILITY**
- **CUT COAL CLEANING COSTS**
- **PROVIDE GREATER SAFETY**
- **PROTECT ROOF AND RIB STRUCTURE**

Get the full facts and evidence at Booth 2000, or write for further information.

CARDOX

Now is the time to put production on a more profitable plan. Let us help you at BOOTH 2000.

CARDOX AUGER MINER

(SURFACE)

drill under overburden and take high-profit tonnage from abandoned seams

Doubly Profitable! **This double drilling operation recovers coal at low cost from a thick seam, formerly abandoned.**

TWO NEW CARDOX AUGER MINER MODELS

MODEL 235

Drills holes ranging from 36 to 50 inches to a depth of 150 feet or more back from the face of the seam. Powered by Hercules DFXE. Hydraulic walkers for moving unit from hole to hole align augers to an accuracy of ½ inch.

Movies of Technical Details and Operation will be shown

DIESEL POWERED MODEL 155 — ON DISPLAY FOR THE FIRST TIME

Powerful rugged Diesel performance and low operating cost!

CARDOX – HARDSOCG VERTICAL DRILLS

- **Fast, easy-to-use drills for blast holes**
- **Drill more holes, in less time at lower cost per hole**

See and get the Facts on the new Tractor Mounted Model at Booth 2000

Full tractor mobility in a new, powerful vertical drill. Simplifies and speeds up drilling. One man can do the job easily.

CARDOX-HARDSOCG Vertical Drills are available in a range of standard and heavy duty models, with gasoline engines or electric motors.

Get full information and suggestions on lower drilling costs at Booth 2000 or write for more data.

Non-Explosive Mining Methods and Drilling Equipment

CARDOX CORPORATION • **BELL BUILDING** • **CHICAGO 1, ILLINOIS**

WAREHOUSES

Harper, West Virginia
Phone: Beckley 4812

Benton, Illinois
Phone: Benton 8-3821

St. Clairsville, Ohio
Phone: St. Clairsville 619

Pikeville, Kentucky
Route 2, Box 99
Phone: Robinson Creek 5

Louisville, Colorado
Phone: Boulder
Hillcrest 2-7298

Library, Pennsylvania
Box 427
Phone: Library Colonial 3-6910

Camden-on-Gauley, W. Va.
Phone:
Camden-on-Gauley 2181

Evansville, Indiana
307 Northwest Fifth St.
Phone: Evansville 2-8944

Ottumwa, Iowa
Phone: Ottumwa
Murray 4-6564

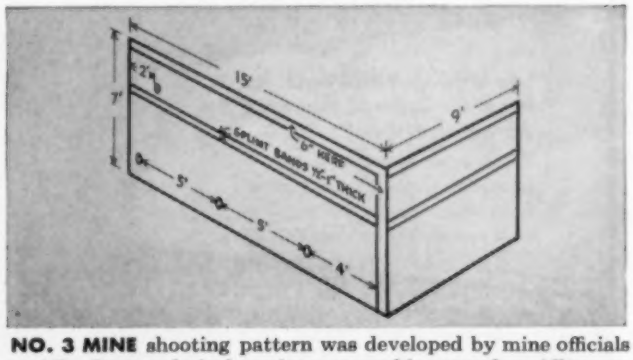
"'Monobel' AA produces maximum coarse coal ...speeds up loading, cleaning operations"

—states Stephen Canonico, President, Compass Coal Co., Elk City, W. Va.

"When we first used Du Pont 'Monobel' AA," said Mr. Canonico, "we were pleased with the high percentage of firm, coarse coal produced. Fines and oversized lumps were held to a minimum. This substantially reduced the time and expense consumed in loading and cleaning. Also, we liked the way this permissible cleanly sheared the ribs and back of the cut . . . making it easy to prepare for the next shot. Since that very first time, we have consistently used 'Monobel' AA."

DIVISION SUPERINTENDENT Joseph Mathews inspects a fall of coal. After his "checkup," loading machines will be brought in. As Mr. Mathews says, "Loading is fast after a 'Monobel' AA shot. 'Monobel' AA throws the coal out—enables our loaders to get at it quickly and efficiently."

ROOM ready to be shot after cutting, shearing and drilling. The wide spreading action of "Monobel" AA will cleanly shear the back and ribs of the cut, leaving no dangerous overhang.



NO. 3 MINE shooting pattern was developed by mine officials and Du Pont technical service men working together. All rooms in this mine are top-cut and sheared.

WET BOTTOM HOLES in top-cut coal are no problem when you use "Monobel" AA. Its high water resistance and other desirable features make it the best all-around coal-mine explosive. It must be good—it's the largest-selling permissible in the world. Let "Monobel" AA help you — try it now. Ask the Du Pont representative in your area for more information or write: E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Del.

Visit Du Pont Booth 207, 1955 Coal Show—May 16-19
Public Auditorium, Cleveland, Ohio

DU PONT
PERMISSIBLES
Blasting Supplies and Accessories

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

MARION *invites you to the*

COAL SHOW

In Cleveland, May 16-19

It's Coal Show Time — Don't miss it!

At Cleveland, in a few days, you can get up to date on everything new in the Coal Industry.

You'll see old friends, make new ones, hear experts in every phase of the industry and have time to enjoy a little relaxation away from your day-to-day routine.

Come to Cleveland—see the exhibits—hear the programs—and get yourself set for the big things ahead.

1 CLEVELAND AUDITORIUM
where Coal Show sessions and displays are located.

2 HOTEL STATLER
Euclid at East 12th—Club Room 345 at the Statler will be Marion Power Shovel Company Headquarters for the Coal Show.

See your MARION friends in Cleveland

Make it a point to see your friends from Marion Power Shovel Company at the Coal Show.

MARION will have an exhibit in Booth 1003 in the Cleveland Auditorium.

Marion Power Shovel Company headquarters for the Coal Show will be in Club Room 345 in Hotel Statler. We'll be looking for you.

MARION • OSGOOD • GENERAL O-G

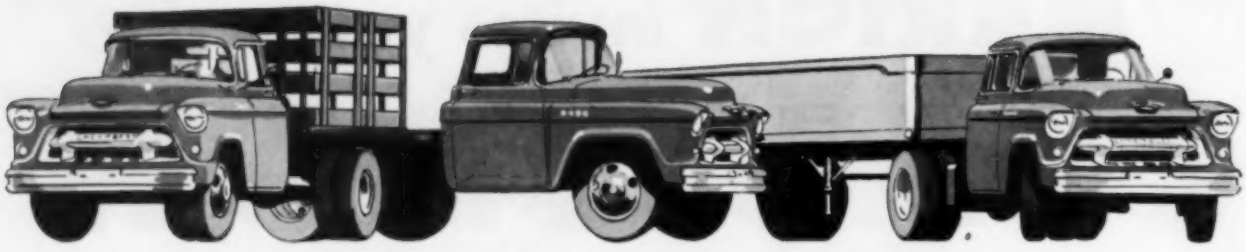
MARION POWER SHOVEL CO. • MARION, OHIO, U.S.A.

A Subsidiary of Merritt-Chapman & Scott Corporation

POWER SHOVELS FROM ½ TO 60 CUBIC YARDS
PILE DRIVERS • WALKING DRAGLINES

DRAGLINES • CLAMSHELLS • CRANES • BACKHOES
TRUCK CRANES • MOBILCRANES • LOG LOADERS

Your Confidence Is Justified Where This Flag Flies

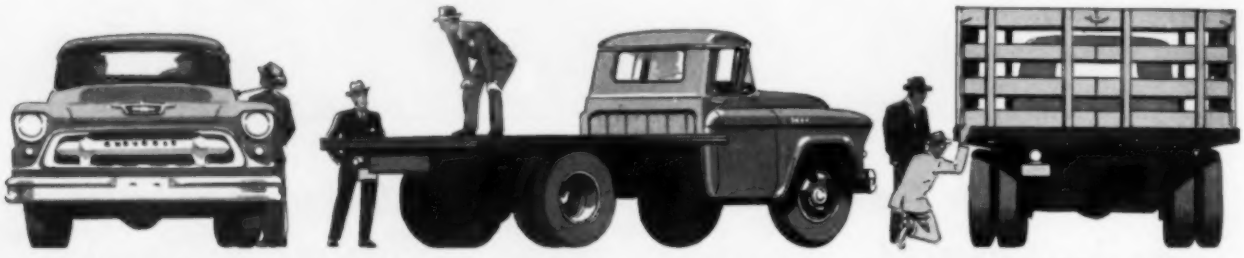


New models—more models—all loaded with new advantages!

NEW CHEVROLET *Task-Force* TRUCKS

Choose the model that's matched to your job. You'll get the most modern engineering features in the industry—and a lower ton-mile hauling cost! Your Chevrolet dealer is ready to supply full details of these important features. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET

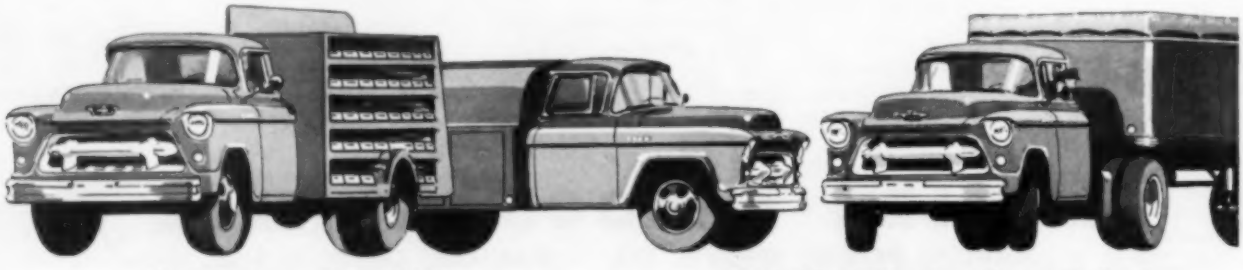


New Work Styling—New Cab Comfort and Safety!

For the first time, heavy-duty trucks with their own individual styling—a brawny design that matches the job! New Flite-Ride cab (even more durable!) features a Sweep-Sight windshield, High-Level ventilation and concealed Safety Step running board.

New Capacity—New Standard Width Frames!

New capacities go all the way up to 18,000 lb. G.V.W. (in 2-ton models). Get this hefty two-tonner and cut operating costs on heavy hauling jobs! All models have new, more durable, 34-inch ladder-type frames with full-length parallel side members.



New Engines—New Ride!

A new 12-volt electrical system sparks all six new Task-Force engines. That means faster, surer starts; increased generator capacity. New suspension, front and rear, provides a smoother, more stable ride.

New Power Steering—Power Brakes!

Driving's easier and safer with these Task-Force power helpers. Power Steering is available on all models as an extra cost option. Power Brakes are *standard* on 2-ton models; optional at extra cost on all others.

TOPS IN TEAM WORK—ALL THREE

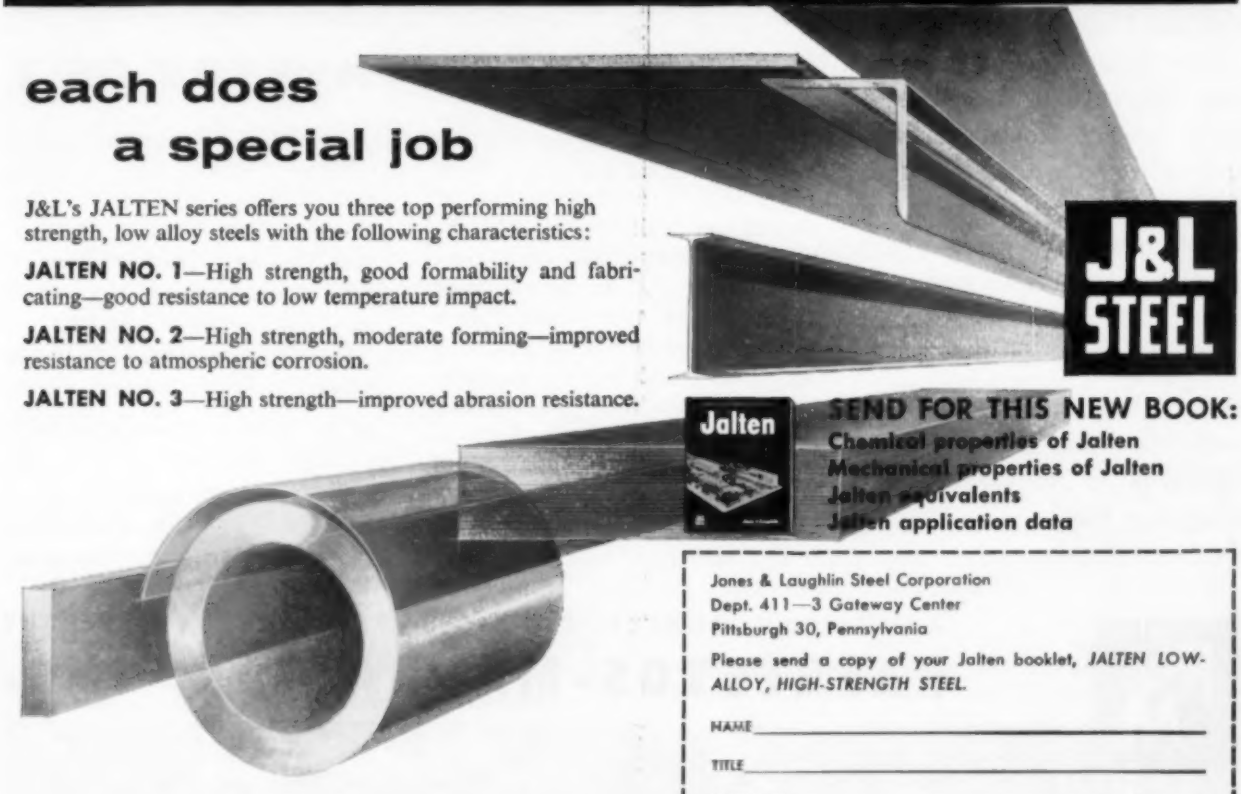
each does a special job

J&L's JALTEN series offers you three top performing high strength, low alloy steels with the following characteristics:

JALTEN NO. 1—High strength, good formability and fabricating—good resistance to low temperature impact.

JALTEN NO. 2—High strength, moderate forming—improved resistance to atmospheric corrosion.

JALTEN NO. 3—High strength—improved abrasion resistance.



SEND FOR THIS NEW BOOK:

Chemical properties of Jalten
Mechanical properties of Jalten
Jalten equivalents
Jalten application data

Jones & Laughlin Steel Corporation
Dept. 411—3 Gateway Center
Pittsburgh 30, Pennsylvania

Please send a copy of your Jalten booklet, *JALTEN LOW-ALLOY, HIGH-STRENGTH STEEL.*

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

HOW TO BUY CONVEYOR BELTS

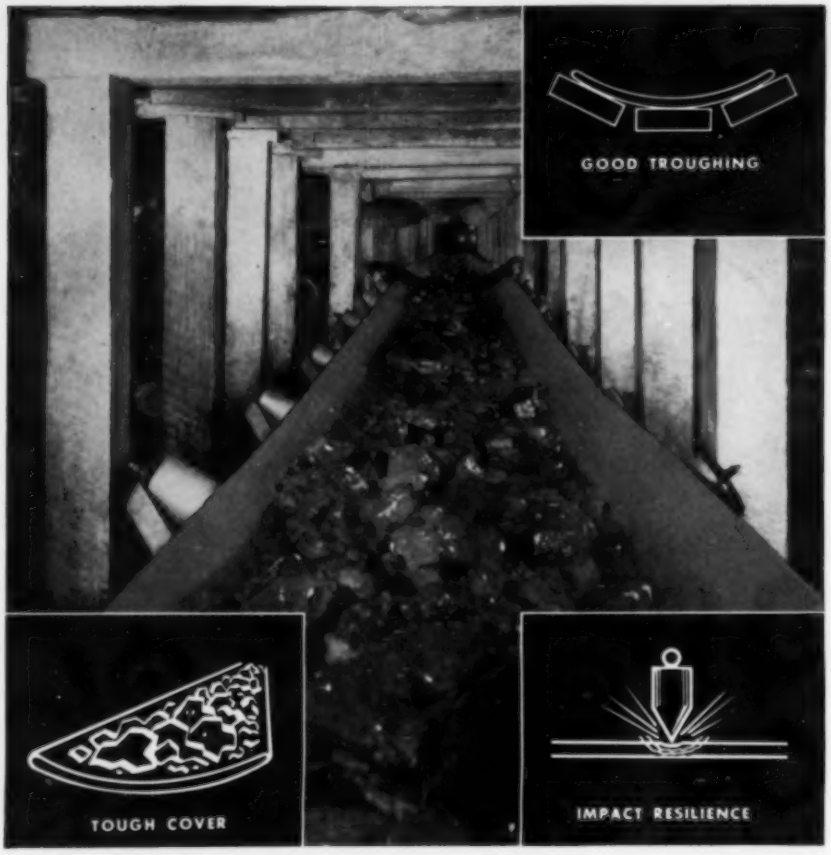
FOR LARGE LUMPS, ABRASIVE LOADS

and get "More Use per Dollar"

Select a belt that assures both maximum flexibility *and* loading impact resistance. One that has high draw-bar strength plus the ability to hold fasteners, and a cover that truly protects and prolongs belt life.

Heavy conventional duck belt constructions fail to provide the needed flexibility and resiliency to absorb heavy loads. They are stiff and "boardy", hard to train on the idlers. Look for a conveyor belt with strength members specially woven to trough easily and cushioned to withstand shock loading. Make certain the belt is moisture and mildew-proof, with protective outer plies and sufficient cover thickness to resist wear and prolong belt life.

Specify by name, the one conveyor belt that offers all these features . . . Ray-Man "F" Conveyor Belt.



RAY-MAN "F" CONVEYOR BELT

This Manhattan conveyor belt combines elastic cushioned inner plies in an outer envelope of strong, yet flexible, synthetic fabric . . . to withstand large, abrasive lumps . . . to permit easy troughability, even where only a thick, narrow belt is used. Special synthetic outer-plies provide maximum elasticity for rounding small pulleys in confined areas. Ray-Man "F" is mildew-proof and, like all Manhattan heavy duty conveyor belts, its service life is greatly prolonged by R/M's exclusive "XDC" Cover which protects it against abrasion, cuts and tears. For unusually abusive shock loading problems you may find extra-cushioned Homocord your best conveyor belt buy . . . or Ray-Man Tension-Master for extra long lifts.

Let an R/M representative help you select the best conveyor belt to meet your job requirement . . . you'll get "More Use per Dollar".

RM-508 UGC

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings
Asbestos Textiles • Packings • Engineered Plastic and Sintered Metal Products • Bowling Balls

"TD-9 Skid-Shovel Practically Doubles My Production"

SLATE PILE SHRINKS quickly at Dewey Trussell Coal Co. mine near Whitwell, Tennessee, as Cureton's TD-9 Skid-Shovel puts heaped loads into 1¼-cu.-yd. bucket, loads trucks at rate of bucketload per minute.

KEEPS THE HEAP. TD-9 Skid-Shovel retains heaped loads of slate in transport by exclusive 41° bucket roll-back feature at ground level. Loads are semi-skidded at ground level in high gear, then held level while raising to dumping position.

INTERNATIONAL DROTT Skid-Shovel removes 600-cu.-yd. slate pile, levels site at coal mine in 10 hours

Strip and shaft mine owners everywhere are in complete agreement on one thing: You can't buy a more versatile, productive, economical mining tool than any one of the four INTERNATIONAL DROTT Skid-Shovels.

John Cureton, Jasper, Tennessee, uses a TD-9 Skid-Shovel to handle jobs around the mines, and reports:

"My TD-9 Skid-Shovel is 'the real McCoy!' I can do everything with it a bulldozer can do—and then some. The pry-out and roll-back action of the bucket enables me to practically double the production. This feature makes the loader!"

More Skid-Shovel features that sharply cut material handling and loading costs include: 300 percent greater break-out force with exclusive Skid-Shoes, exclusive bucket roll-back at ground level, load transport at ground level in high gear, level lift, highest lift, and farthest pitch. There's the patented Hydro-Spring feature, too—a super shock absorber that reduces all hydraulic shocks by more than 70%.

Call your INTERNATIONAL Industrial Power Distributor today for your demonstration. Skid-Shovels come in ⅞, 1¼, 2 and 3 cu. yd. sizes for the TD-6, TD-9, TD-14A and TD-18A crawlers. And you simply can't calculate how much more work they do than similar sized loaders until you see them work . . . on your own diggings.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS
DROTT MANUFACTURING CORP., MILWAUKEE 8, WISCONSIN

INTERNATIONAL HARVESTER

INTERNATIONAL® DROTT

OC-18 strips more yards per dollar... extra power, high speeds do the trick!

On this strip mine operation an Oliver OC-18 with cable dozer was used to remove overburden. Long, heavy dozing runs were needed to clear the site. The OC-18 with its fast, powerful dozing gear and high-speed reverse proved the most profitable choice.

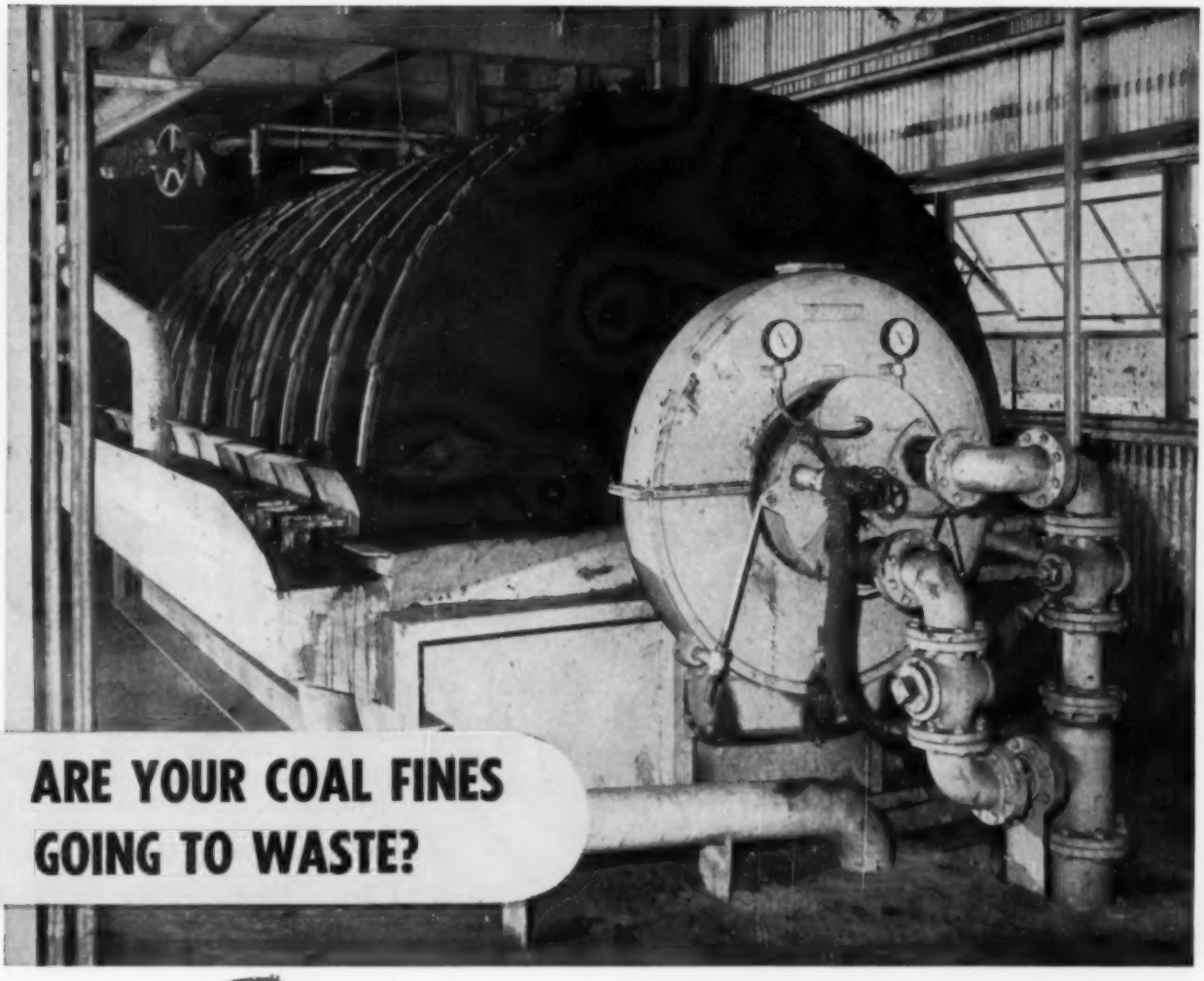
The high-stepping diesel engine in the OC-18 features an exceptional torque span—lugging power steps up as the tractor slows under load. In first gear, the OC-18 gives 31,000 drawbar pounds' pull at 1½ miles per hour! This rugged tractor can move more yards in less time. And with a high reverse of 3½ miles per hour, it will cut hours and dollars from your dozing cycle.

The OC-18 gives you more for your money, too. Balanced design eliminates dead weight... puts every ounce of power to work at lowest fuel cost. In fact, the OC-18 has the greatest power-to-weight ratio of any tractor in the 133 drawbar h.p. class.

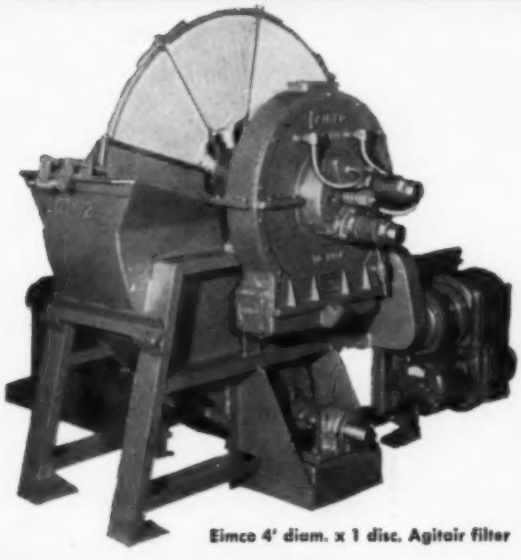
For sheer operating ease and maneuverability, the OC-18's finger-tip air steering and convenient controls take second to none. Test this fast, powerful tractor yourself. Call or visit your Oliver Industrial Distributor for a demonstration.

THE OLIVER CORPORATION

400 West Madison Street, Chicago 6, Illinois
a complete line of industrial wheel and crawler tractors



ARE YOUR COAL FINES GOING TO WASTE?



Eimco 4' diam. x 1 disc. Agitair filter

Coal fines are an economical source of revenue, they can be reclaimed and will pay in a short time, for all equipment necessary to make the installation.

Several flow sheets employ Eimco filters as the dewatering equipment in plants set up to reclaim the fine coals. Eimco filters are best because they do the job for less money.

Eimco filters will dewater greater tonnages per square foot of filter area per hour. They are simple in design and built for long periods of continuous operation with a minimum of attention. They produce a thick, evenly distributed cake formation, uniformly dried to low moisture content. Eimco filters have a clean discharge of the cake which provides much greater bag life and many other advantages.

Write for complete information on fine coal dewatering with Eimco Agidisc filters.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Texas Birmingham, Ala. Duluth, Minn. Kellogg, Ida. London, Eng. Paris, France Milan, Italy

5-61

You Can't Beat An Eimco!

17,435,250 yards

Only 4 Page Automatic Buckets needed to excavate this enormous yardage of slate, blasted rock, and earth overburden. The Peterson Coal Company, Deerfield, Ohio, moved this material since 1942 with a Page Model 618 Walking Dragline and 5 cu. yd. buckets. The two buckets shown in the photo, and one other, are worn beyond economical repair but the Model 618 and the bucket on it are still in good condition.

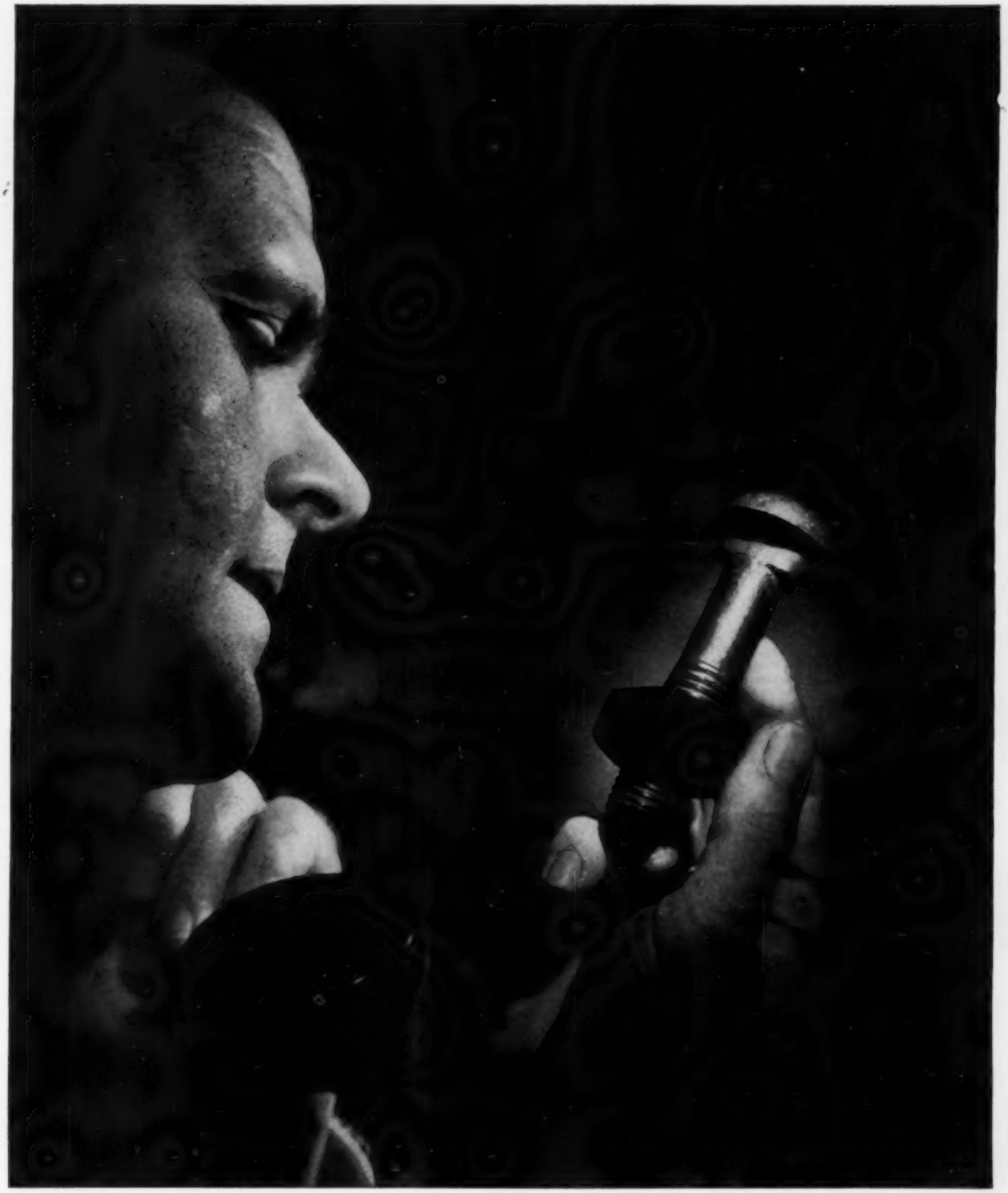
"That's what we call good service," says Mr. Clyde Peterson, "so when we needed more coal than the 618 could uncover, we bought the Model 721 Page Walker shown in the picture. With a 7 cu. yd. bucket and 125 foot boom it's just what we wanted. Fast, economical, and easy to operate; and the new Page horizontal V-6 Diesel engine has plenty of power for even the heaviest load."

Page Automatic Buckets are noted for their digging ability. Write for bulletin GPB454 for details.

AUTOMATIC DRAGLINE BUCKETS
DIESEL & ELECTRIC WALKING DRAGLINES

SEE US at Space 2537 at the Coal Show

Page
ENGINEERING CO.
Clearing P.O. Chicago 38



"Satisfied with Bethlehem Track Bolts? You bet we are! They're top quality all the way."

Spikes and machine bolts, too!

BETHLEHEM STEEL

Mack Model LRSW hauling off overburden.

big shovels call for big trucks

Today's big-yardage jobs demand maximum loads per haul and faster time cycles from shovel to dumping point and return. Increasing use of larger and larger shovels points to the Mack Models LRSW and LRVSW six-wheel dump trucks as the answer to these stepped-up requirements.

Here are trucks that are built to keep big shovels on the go...to give mine operators increased production per driver and per truck dollar invested.

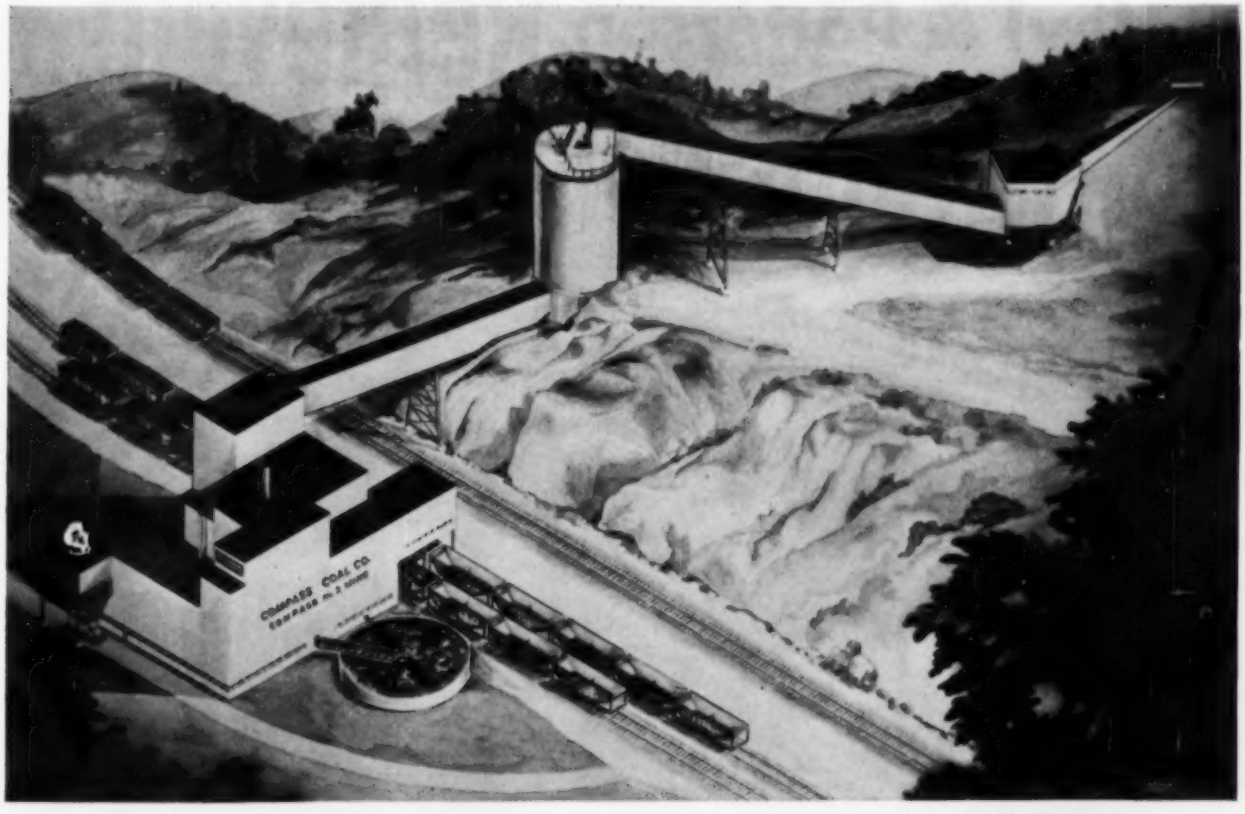
These Macks will move 21 to 28 yards with unfaltering ease over the toughest terrain. No miring in with these Macks—they have the advantage of Mack's famous Balanced Bogie with exclusive Power-Divider, enabling them to pull through where other trucks bog down. In actual service these models have demonstrated their ability to maintain the time schedule of smaller-capacity dumpers.

Why not investigate the big-unit economy of Mack Models LRSW and LRVSW. It will pay you to see these big jobs at work.

MACK TRUCKS Empire State Building, New York 1, N. Y.

3030

Visit Booth 2423 at the 1955 COAL SHOW



FAIRMONT

. . . the modern approach to coal preparation

In over half a century of continuous operation, Fairmont Machinery Company has kept abreast of the latest developments in coal cleaning and has become nationally known as a leader in the design, fabrication and erection of coal preparation plants.

Fairmont's policy of qualified, coordinated planning has resulted in consistent economy for coal producers throughout the bituminous coal industry.

This coordinated responsibility has provided top separating efficiency through....

1. *Coordinated design, engineering, fabricating and erecting services.*
2. *Independent choice of equipment best adapted to specific requirements.*
3. *Pilot crews provided to instruct permanent crews.*
4. *A well-planned installation that amply meets present needs while providing for the future.*

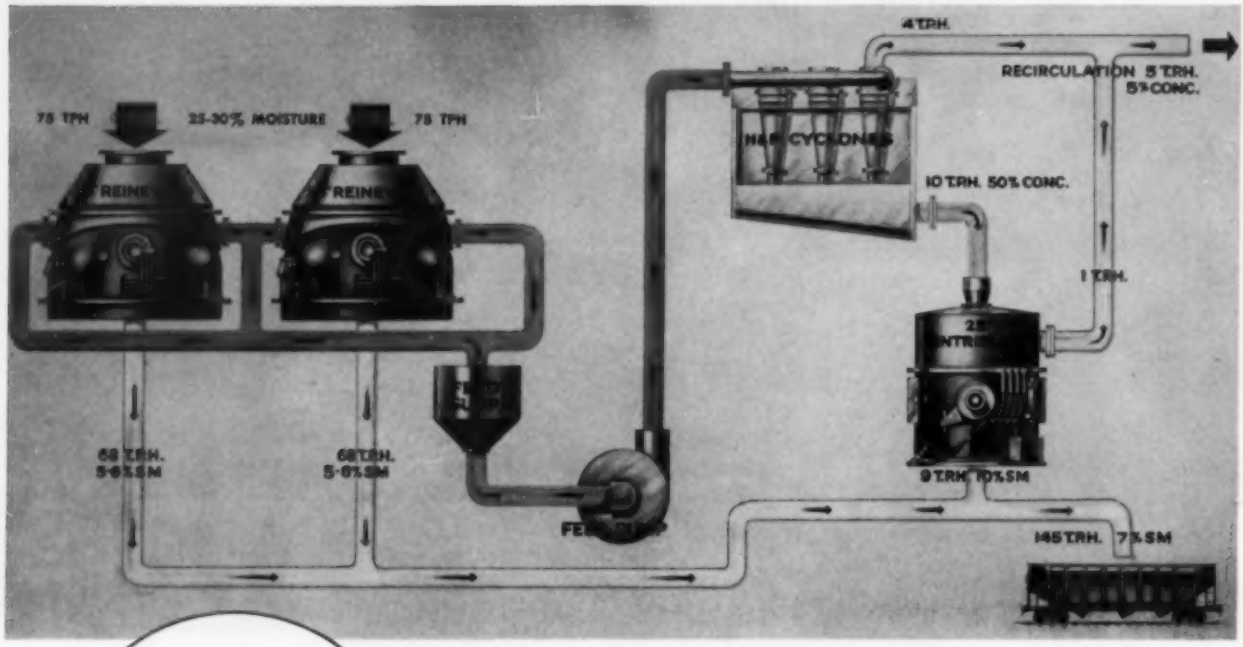
To upgrade your coal product and guarantee its uniformity... call a Fairmont Engineer! Over 99% separating efficiency through a wide product size range of ⅛ to 10" in any tonnage capacity, is available through Fairmont-Built coal preparation plants.

FAIRMONT MACHINERY COMPANY

FAIRMONT, WEST VIRGINIA

DESIGNERS AND CONSTRUCTORS OF COMPLETE COAL PREPARATION PLANTS USING BOTH WET AND DRY CLEANING, CENTRIFUGAL AND THERMAL DRYING.

Heyl & Patterson Reineveld Centrifuge-Cyclone Circuit



Centrifuge-Cyclone System

FOR DRYING AND EFFECTING MAXIMUM RECOVERY OF 150 TONS PER HOUR OF 1/4" × 0 COAL

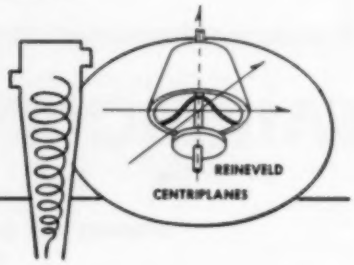
Here is a System that will recover fine size coal economically

Your Visit to the Heyl & Patterson Exhibit . . . Booth 1638 . . . will be interesting and informative as well as Profitable from a Coal Recovery Viewpoint.

See All . . . Get All . . . the facts from Heyl & Patterson at the Coal Show.
Don't miss visiting Heyl & Patterson's Booth 1638.

Heyl & Patterson INC.

55 FORT PITT BLVD. • PITTSBURGH 22, PA.



THE BOSTON MAN
in your area is ready
to serve you . . . today!

THE BOSTON MAN
cuts costs with advanced new rubber products

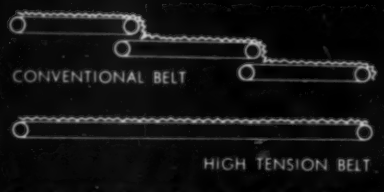
1. Fewer and stronger plies mean easier troughing and flexing.

2. Synthetic fabric plies have high strength to bulk ratio —give more strength per pound.

3. Mildew-resistant for longer life.

4. Skim coating prevents fatigue failure caused by flexing.

5. High transverse and longitudinal strength means lighter, thinner belts.



Boston's tough synthetic fiber ducks allow big increases in center distances, eliminating extra transfer points, as this chart shows.

NEW BOSTON HIGH-TENSION CONVEYOR BELT
is 4 ways better yet costs less to use!

You'll cut materials handling costs and lower horsepower requirements with new Boston High Load and Boston Haul King conveyor belts. Check these service advantages: (1) Superior synthetic fiber ducks allow longer centers, higher lifts. (2) Stronger construction means lighter belts, less horsepower, less cost. (3) More flexible, better troughing and training. (4) Stretch less and need less take-up.

For *extra heavy* service use Boston High Load, and Boston Haul King for *general heavy duty* in high tension, high stress applications. Plan longer centers and use fewer flights to get more economical hauling. Write for information.

See our distributor in your area. He is your "Boston Man."

BOSTON

See Boston Exhibit
Coal Show, Cleveland
May 16-19, Booths Nos. 2604-2606

BOSTON WOVEN HOSE & RUBBER CO., Box 1071, Boston 3, Mass.

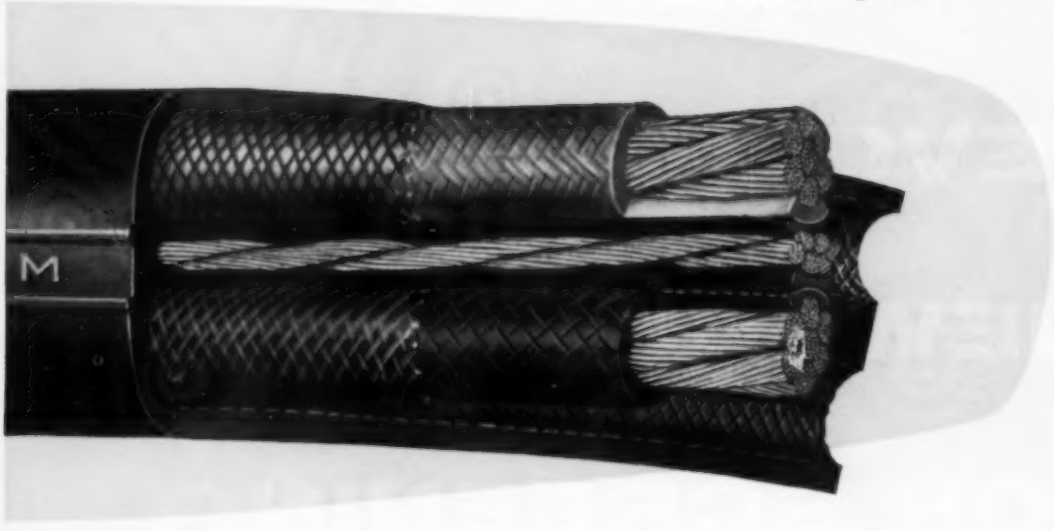
Industrial Hose • Fire Hose • Belting • V-Belts • Packing • Tubing • Garden Hose • Tape • Matting and Stair Treads

COME TO THE CLEVELAND COAL SHOW
Visit us in Booth 1205

Want more tons per cable?

Quality mine cables and cords

- Multiple-conductor power cables—Type W and G
- Type SO portable cords
- Single-conductor locomotive cables
- Mine power distribution cables
- Shovel and dredge cables
- Shot firing cord



Then read this

These 5 service advantages will help you get more tonnage per cable dollar

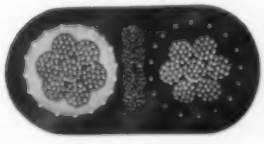
You can reduce the cost of cable failure . . . by buying the best.

You know that cable failure means (a) lost tonnage, (b) downtime, (c) idle machinery, (d) repair expenses, (e) cable replacement expense. Add all these together and the cost of the best cable is low, because it lasts longer. It reduces the number of failures.

Here's how you can tell the best. Check this list of advantages you will gain with Rome 60 parallel duplex mine cable.

1. FLEXIBLE—Tough Neoprene webbing separates grounding conductor from insulated conductors. This gives you . . . high impact resistance, low conductor fatigue, better protection against "shorts," and maximum flexibility.

2. INTERLOCKED CONSTRUCTION—This cross-section shows what interlocked construction is . . . the open braid around each conductor locks the conductor to the Neoprene sheath. Twisting, pulling or flexing will not separate conductors from the sheath.



3. OVERLOAD PROTECTION—The insulation is compounded for heat resistance to permit continuous operation at 167°F. (75°C.) which is adequate protection against deterioration under high overloads.

4. NEOPRENE SHEATH—The tire-like toughness of the molded-in-lead Neoprene sheath protects your cable against impact, acids, oils, abrasion and flame.

5. MEETS MINING CODES—The surface marking "P-105 BM" means that Rome 60 mining cable conforms to State of Pennsylvania and Federal Bureau of Mines Safety Codes.

When you invest in Rome 60, you make your total investment in men and machinery pay off best. Prove it to yourself. Order Rome 60 today.

It Costs Less to Buy the Best

ROME CABLE Corporation
ROME · NEW YORK
and
TORRANCE · CALIFORNIA

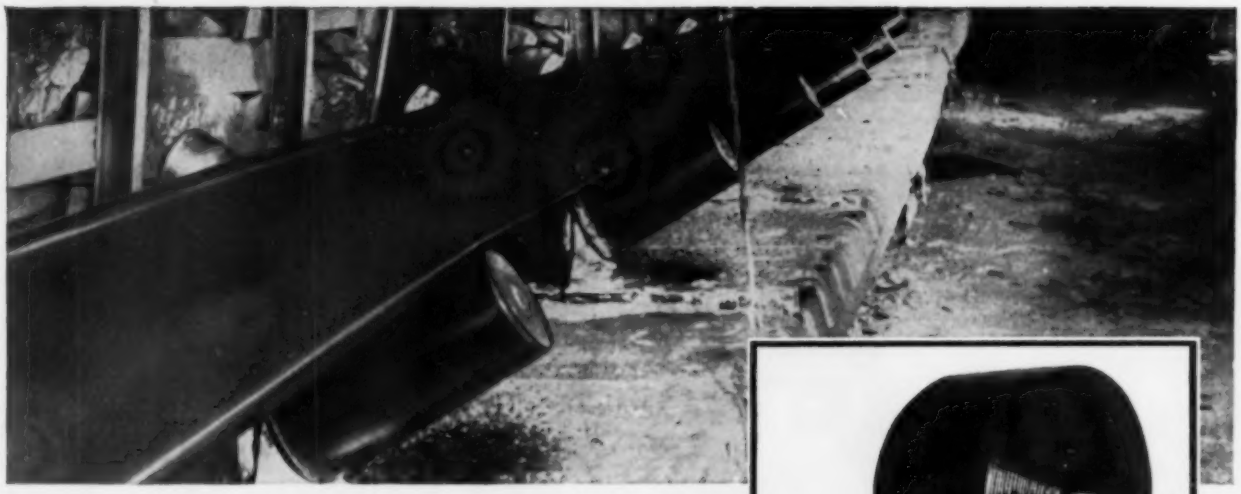
SEE THE
REVOLUTIONARY
NEW PRINCIPLE
FOR SCREENING
AT THE
COAL SHOW

hi G

BOOTH 700

CLEVELAND COAL SHOW

Hewitt-Robins
INCORPORATED STAMFORD, CONN.



*Top photo shows Face Conveyor in British coal mine. Inset shows roll of SCANDURA.

NEW SCANDURA

the original P.V.C. coated

CONVEYOR BELTING

eliminates big FIRE HAZARD in mining operations

One of the great hazards of mining—fire caused by a belt stalled over a still-rotating driving drum—is eliminated by new SCANDURA BELTING .... the original P.V.C. Coated Conveyor belt which was developed in the United Kingdom and now manufactured by us in our Charlotte, N. C. plant.

LET'S LOOK AT THE RECORD!

About 12% of coal mining fires in the past several years have been attributed to conveyor-belt friction.

At the 1953 annual meeting of the Illinois Mining Institute, data was presented to show that the majority of belt fires result from stalled belts while the driving pulley continues pulling.

In the tragic Evanston, Ky. fire in which 4 men lost their lives, fire was reported to have had its origin in the friction caused when a fall stopped the belt, while the drive motor continued to operate.

This record clearly points to the great need for SCANDURA BELTING!

Other unique SCANDURA features:

- *Withstands abrasions that would ruin other belts.*
- *Exceptionally tenacious in holding fasteners.*
- *Solid woven base with covers that will not strip, gouge or "dog ear".*
- *Not affected by water, dilute acids, alkalis, salt solutions, etc.*
- *Non-inflammable, mildew and rot-proof.*
- *Works in temperatures ranging from 22° below to 212° above.*
- *Can be made in widths from 1" to 42" and thicknesses from 1/8" to 3/8".*

SCANDURA has been tested and used with gratifying results in Britain since 1946. For safety and economy, it's in a class by itself. Write, wire or telephone for complete data.

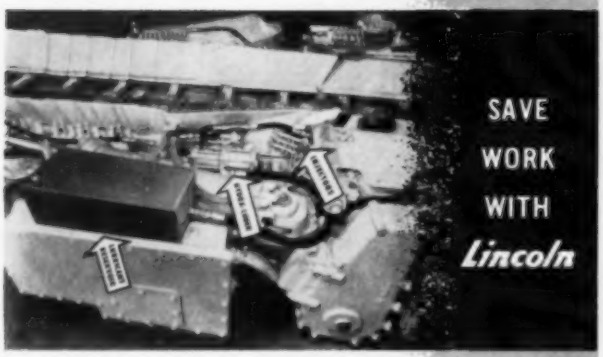
SCANDINAVIA BELTING COMPANY

250 CENTRAL AVENUE, NEWARK 1, N. J.

BOSTON • PLANT: CHARLOTTE 1, N. C. • CLEVELAND

here's why **Lincoln** lubricating equipment

slashes operating costs IN MINES



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Use Primacord wherever there is danger of stray electrical currents — and particularly during thunderstorm seasons.

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Primacord — Quarrycord — Ignitacord® Safety Fuse — Blasting Accessories
Established 1836

To connect a Branch Line of Plastic Reinforced or Plastic Wire Countered Primacord with the Trunk Line

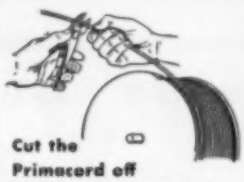
use this DOUBLE HITCH in the textile-covered Primacord Trunk Line. *Draw it up as tight as you can, and make sure that the Branch Line leads off at a RIGHT ANGLE to the Trunk Line.*

PRIMACORD®

DETONATING FUSE

PROVED AND APPROVED

P-21



Cut the Primacord off the Spool Immediately

Make this a safety habit! As soon as you have taken off the length of Primacord you need for a down-hole or for a trunkline, *cut it off the spool! Don't waste a second — do it now!*

To connect the Detonator with the Primacord Trunk Line

use FRICTION TAPE. You can detonate Primacord with fuse and cap or electric blasting cap. Lay the cap alongside of the Primacord with the business end of the cap pointing in the direction that the Primacord will detonate. Tape the two snugly together, so that you have a tight connection.

To connect a Branch Line with the Trunk Line

Use this HALF HITCH for Plain and Reinforced Primacord. *Draw it up as tight as you can, and be sure the Branch Line leads off at a RIGHT ANGLE to the Trunk Line.*

To lengthen a Trunk Line

of Plain or Reinforced Primacord, tie a SQUARE KNOT. *Draw it up as tight as you can* — it won't slip back. Caution: don't use any knot in a hole — it might break or hang up explosives when loading.

Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

MAY, 1955 IVAN A. GIVEN, EDITOR

The Road Back

SPRING this year has a special meaning for the bituminous coal man. He welcomes the birds and the bees and the flowers and baseball, but he especially welcomes the extra million tons a week coal consumers are asking him to mine. Up to April 16, this extra tonnage had raised total bituminous production 13.7%, or more than 15,257-000 tons, compared to the same 15 weeks last year.

What's ahead? The experts say the level of business activity will continue and quite probably increase. This means an active steel industry, and increased use of electric power. Stockpiles on March 1 were down 11½ million tons from March 1, 1954, and 4½ million tons from Jan. 1, 1955. A further decrease may be expected and then rebuilding will be necessary, starting not later than fall. The Lake season is only beginning. By July 1, therefore, it is easy to see an increase of 25 million tons, with more to come in the last half and improved growth prospects in 1956 and beyond.

Coal definitely is on the road back. What should it be doing while it is enjoying this bulge in demand? One thing that would help wonderfully would be greater emphasis on hard-hitting merchandising.

GAW—When? Or If?

GAW, meaning "Guaranteed Annual Wage," may or may not become an important element in contracts between management and union in the United States. It is too early to tell whether the United Automobile Workers really mean to make a fight, and if so to tell whether they will win. Since coal may become a target, the question is of more than academic interest. For that reason, a new approach to GAW evolved by William Chartener, of the McGraw-Hill Department of Economics, becomes quite pertinent, especially since coal is one of the leading practitioners of the philosophy Mr. Chartener bases his conclusion on, as follows:

"As a matter of fact, the high cost of idle equipment may eventually make the guaranteed annual wage a largely academic issue. As industry ties up more money in expensive equipment, it becomes increasingly important to management to maintain steady production schedules. Idle machines are an expense to business even when idle workers are not. In the years ahead the huge expenditures of American business in new plants and equipment since the war, totalling some $215 billion, may well have more influence in stabilizing employment than the guaranteed annual wage. If this is the case, it will correspondingly reduce both labor's needs for a guarantee and employer's fears of undertaking it."

Dollars for Dollars

ONE MILLION BUCKS to equip a single working section sounds like—and is a lot of money. Nevertheless, it is a logical step in the development of the coal industry, which has accepted the principle that to make dollars you have to spend dollars. For this million, the section will turn out upwards of 3,000 tons a day—at a very low labor cost, naturally. Thus, the million is warranted and will pay off handsomely, especially since extra care will be taken to see that the facilities are given the fullest-possible opportunity to produce at maximum capacity. In fact, that is the secret of spending dollars to make dollars. With good maintenance, transportation, power and other services, even higher expenditures per man and per ton may be warranted, as long as the saving in labor cost is appreciably greater than the extra costs growing out of the higher machine investment. Therefore, to make the most out of investment, regardless of its scale, look to service.

INDIANA (Maumee) . . .

SHOOTERS prepare to load Akremite (right) and primer (left), both packed in polyethylene wrapper.

AKREMITE IS DELIVERED from mixing plant on Maumee property near the pits to explosives trailers on the job.

WEST KENTUCKY (Colonial) . . .

LOADING AND SHOOTING is handled by drill crew which places an average of 13,600 lb of Akremite per shift.

LOW-COST OVERBURDEN PREPARATION increases strip-mine life by permitting attacks on thicker cover.

ALABAMA (Robbins) . . .

REMOVAL of 20 to 30% of the overburden into the spoil area by Akremite alone is made possible by the low cost of the explosive. Cover here is hard sandstone and shale, and the charge is 1 lb of Akremite per 2.67 cu yd of rock.

AKREMITE, made of low-cost ingredients, permits shooting for optimum fragmentation and resulting increase in unit output. R. L. Akre (right), Maumee's superintendent of drilling and blasting, lends his name to new explosive.

Report on Akremite

The "Make-Your-Own" Stripping Explosive

The story of the development of a new strip-mining explosive—How it is prepared and used, and what it is doing at mining properties in three states to reduce the cost of charging blastholes and to permit the stripping unit to make more productive swings per hour of operating time.

By HAROLD DAVIS
And A. E. FLOWERS,
Associate Editors, COAL AGE

A NEW BLASTING MEDIUM is the latest in the contributions of the Maumee Collieries Co. to efficiency, economy and safety in strip-mining of coal. Features of the new patented blasting medium, known as Akremite, the culmination of a 2½-yr development program, include:

1. Preparation on the job, eliminating among other things the high cost of transporting fixed explosives.
2. Use of low-cost commonly available materials; namely, commercial-grade ammonium nitrate and carbon black.

The impetus to develop better bank-preparation methods was generated by Maumee contemplation of an ever-increasing stripping ratio in future operations, and parallel recognition of the fact that the costs of such work would be critical. Improved drilling and shooting were called for, and a program to achieve these ends was set into motion by Hugh B. Lee Sr., Maumee president.

Direction of the development work was given over to Robert L. Akre, superintendent of drilling and shooting, assisted by David W. Aten, Maumee vice president and secretary,

SMOOTH SHEAR and less shattering at the highwall and better fragmentation are added benefits at Robbins.

ALABAMA (DeBardeleben) . . .

MIXING PLANT on DeBardeleben property converts ammonium nitrate (commercial grade) and carbon black into Akremite. Mixing and packaging equipment need not be expensive, and mine workers may be trained for the job.

VERTICAL AND HORIZONTAL DRILLING are sometimes combined at DeBardeleben operations, where the cost of breaking overburden has been markedly reduced and the stripping rate increased about 25%.

and Lafe Stewart, chief engineer. Mr. Akre proceeded on the basis that "as far as overburden preparation is concerned, the world is new." Drilling methods and equipment were first to be scrutinized, with the result that he was instrumental in developing the first 50-R overburden drill in cooperation with Bucyrus-Erie engineers (see *Coal Age*, March, 1953, p 80).

Next came a study of the explosive agent, which drew on Mr. Akre's 30-yr experience in bank shooting, including several years as field explosives representative of a major powder company. The outcome was the development of the new explosive, Akremite (after Mr. Akre), which has been patented by Messrs. Lee and Akre and now is being licensed to other strip operators by Maumee.

THEORY OF AMMONIUM-NITRATE BLASTING

The idea for Akremite came out of a fresh approach to materials with which the entire explosives industry had long been familiar. Although ammonium nitrate in its normal commercial-grade form is not an explosive material, it was known to be the chief ingredient in many explosives selling at several times its price. Messrs. Lee and Akre theorized that it should be possible to use it as an explosive with only minor additional processing and thus achieve substantial savings.

In early experiments at Maumee it was discoverd that if carbonaceous material of the proper character were added to ammonium nitrate it was possible to detonate completely the mixture if a granular non-caked charge is tightly packed in a flexible package, then placed in a blasthole in such manner that all air pockets are eliminated. With tight stemming, the charge can then be detonated by a primer charge adjacent to the packaged ammonium-nitrate mixture.

Thus, the Akremite method employs materials having theoretical properties long known to the explosive industry, but now prepared in a manner leading to a fuller realization of these potentials. Thus, also, Akremite marks a new step forward in the development of blasting agents, starting with the black powder of the ancients, down through Alfred Nobel's compounding of the more stable dynamite from high-strung nitroglycerin, the World War I development of ammonium-nitrate explosives and the employment of liquid-oxygen explosives for overburden shooting beginning in the 1920's.

The Maumee patents (March 8, 1955) cover all details and applications involved in using the Akremite method in bank shooting in open-cast operations of all kinds. Other patent applications cover related procedures, including the preparation and use of an effective primer charge which has been developed by the Maumee staff for license to explosives manufacturers.

TESTING AND RATING THE NEW BLASTING AGENT

More than 8,000,000 lb of Akremite has been shot without misfire or

Maumee Practice

MINES: Chieftain No. 20, Riley, Ind., and Sullivan No. 27, Linton, Ind., The Maumee Collieries Co.

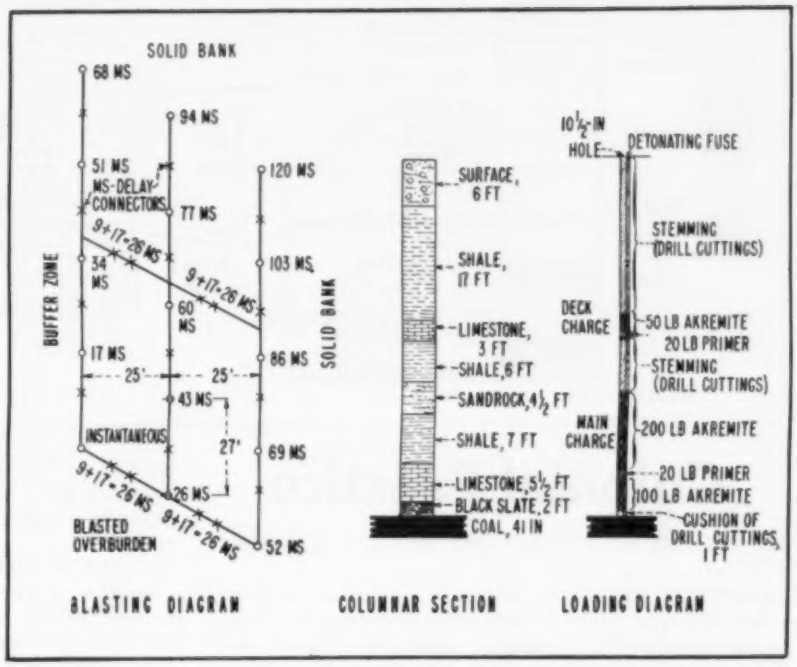
SHOOTING RESULTS: Blasting ratio, Mine No. 20 (hard dolomitic limestone in bank), varies from 3.30 to 4.63 cu yd of rock per lb of explosive, depending upon character of overburden. Mine No. 27 ratio, with solid sandstone in bank, varies from 2.26 to 3.40 with changes in the overburden.

Better fragmentation increased yardage moved 8.05% at Mine No. 20 and 10.17% at Mine No. 27, as data in table indicate.

Akremite used pound-for-pound in replacing the former blasting agent.

Increase in dragline efficiency has been sustained, as shown by cycles-per-hr averages previously mentioned for the 6-mo period from September, 1954, through February, 1955, using Akremite, over the fiscal year ending Aug. 31, 1953, using fixed explosives. Mine No. 20 increase was from 80.34 to 84.46 cycles per hr of actual digging, at Mine No. 27, from 75.99 to 80.87 cycles per hr.

Furthermore, easier digging as a result of better fragmentation has led to improved maintenance, as shown by reduction in digging delays expressed as percentage of possible running time. At Mine No. 20 the current figure is 14.49%, against 20.52% during fiscal 1953. At Mine No. 27, digging delays now are 16.07% of possible running time, against 18.26 in 1953.



Cubic Yards Removed per Hour of Actual Digging

	Mine No. 20 1150-B Dragline 25 Cu Yd		Mine No. 27 1250-B Dragline 30 Cu Yd	
	1953 Explosive A*	1954 Akremite	1953 Explosive A*	1954 Akremite
April	1,286	1,489	1,593	1,930
May	1,419	1,411	1,704	1,687
June	1,455	1,531	1,252	1,627
July	1,450	1,630	1,978	1,946
Average	1,403	1,515	1,632	1,798

*Weight strength, 65%

Maumee No. 20 Practice

SEAM: Indiana No. 5, 41 in thick

OVERBURDEN: Average thickness, 51 ft, including, as shown in columnar section, two layers of hard dolomitic limestone interbedded with sandrock and shales. A layer of tough black slate, which is usually about 2 ft thick, lies immediately above the coal.

DRILLING: Bucyrus-Erie 50-R drill, making 10⅝-in vertical holes in pattern shown in accompanying sketch. Blasting crew includes drill operator and two shooters on each of two drilling shifts and preparation foreman who laps both shifts. Drilled footage averages in excess of 100 ft per hour.

CHARGING PLAN: Blastholes drilled down to the coal to insure complete penetration of the tough black slate overlying the seam. Cushion of drill cuttings is dropped into hole to form a base for charge 6 to 12 in above top of seam, insuring breakage of black slate without pulverizing coal.

Primer is 20 lb of cap-sensitive explosive in polyethylene bag; Akremite also is handled in polyethylene, 50 lb per cartridge occupying 18 inches of height as confined in hole. Main charge in typical Mine No. 20 overburden is 100 lb of Akremite at bottom, then 20-lb primer, then 200 lb Akremite. Deck charge, for breaking top limestone, is 20-lb primer under 50 lb Akremite. Primers made up by Austin Powder Co., and laced with Austin detonating fuse.

Drill cuttings provide excellent stemming, the shooters charging and tamping each hole as drill moves away to start next hole.

Blasting usually is done every 48 hr or at the end of a shift. Holes are linked through detonating fuse with ms connectors between rows and holes. Highwall blasts are made against 60-ft wide buffer of previously shot overburden for better fragmentation and fewer highwall slides. Delay interval between rows is 26 ms, between holes in row, 17 ms. A secondary tie-line links rows near center of the pattern to insure detonation of the blast.

Burden per hole is calculated at 25 cu yd per ft. Use of polyethylene bag permits complete filling of hole, thus, less wasted explosive energy and more uniform breakage throughout.

MATERIAL SOURCES: Commercial grade ammonium nitrate, Spencer Chemical Co., Kansas City, Mo.

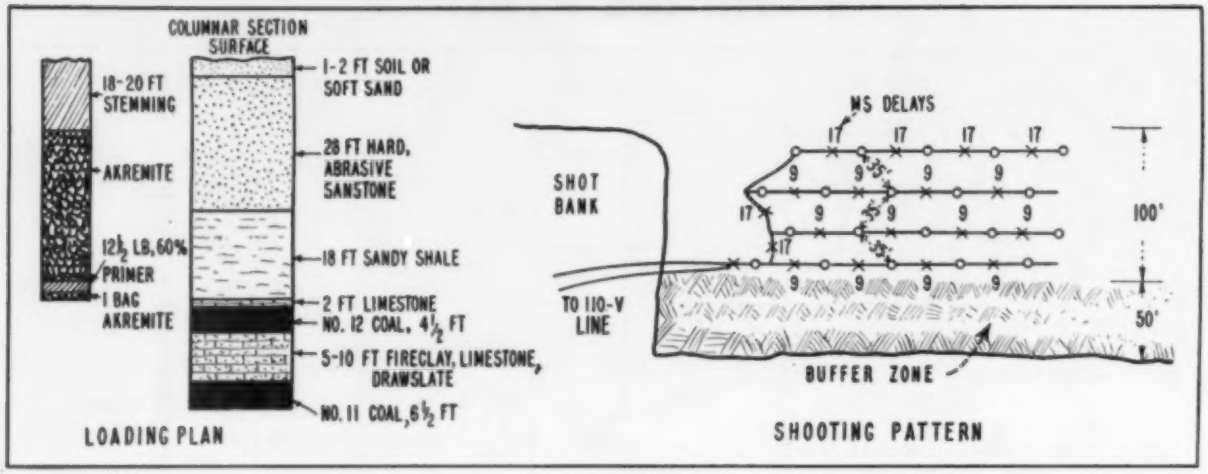
Carbon Black: R. T. Vanderbilt Co., New York

Primer Packages: patent applied for by Maumee; Austin Powder Co., Cleveland

Polyethylene Bags: Visking Corp., Terre Haute, Ind.

Detonating Fuse: plastic cover, Austin Powder Co.

Detonators: No. 6 regular, delays, Hercules Powder Co., Wilmington, Del.



Colonial Practice

MINE: Colonial, Colonial Coal Mining Co., Madisonville, Ky.

SHOOTING RESULTS: Akremite combined with new rotary dry-type vertical drill increased stripping output by 90 cu yd per hr. Because of unusually difficult conditions encountered in a faulted area since Akremite has been used, it has been difficult to measure benefits accurately, but management feels that using Akremite pound for pound in place of conventional ammonia explosives, a 40 to 60% savings in cost of explosives is achieved. Explosives ratio is 1 lb to 3¼ cu yd of overburden.

SEAMS: West Kentucky Nos. 11 and 12.

OVERBURDEN: Hard abrasive sandstone, sandy shale and limestone, with the sandstone predominating as shown in diagram. Average thickness removed is 50 ft over No. 12 coal.

DRILLING: Vertical 50-R rotary dry-type drill bores 10⅝-in holes on maximum of 35-ft centers. Hole spacing depends on thickness of overburden. Three-man crew handles drilling and shooting, averaging 125 ft per hr, including drilling, moving, loading and wiring. Average shift is 875 ft of drilling and placement of 13,600 lb of Akremite. Drill keeps well ahead of two stripping units and was not operated for a 2-mo period while stripping caught up. Holes are drilled only to limestone cap rock over No. 12 coal.

CHARGING PLAN: Charging chart is placed in the small powder wagon to guide blasters in loading. Proper charges to yield 3¼ cu yd of overburden per pound of Akremite are listed for various hole spacings. In all cases 18 to 20 ft of stemming is used. Holes are loaded fully with Akremite to within 18 to 20 ft of top and one or two primers are used, depending on depth. If less than 400 lb of explosives is need per hole, only one primer is needed. A 50-ft buffer of broken rock is maintained.

Akremite Consumption at Colonial

Month	Quantity, Lb.
May, 1954	16,000
June, 1954	50,000
July, 1954	80,000
August, 1954	123,000
Sept., 1954	170,000
Oct., 1954	218,000
Nov., 1954	50,000
Dec., 1954	17,000
Total	724,000

other mishap at Maumee's three mines during the trial period. The new agent has been tested side-by-side with 20 other overburden explosives, including three variations of liquid oxygen, and Mr. Lee reports that in all instances the Akremite has produced highly satisfactory fragmentation at lower cost.

Following through in the matter of costs, ammonium nitrate, the principal ingredient, costs about 3¾c per lb fob place of manufacture and the other ingredients need not cost more than this. The materials may be shipped at ordinary commercial freight rates, not the higher fixed-explosive rate. At Maumee, the total cost of materials, mixing, packaging and delivery to the pits is less than 6c per lb, which with Akremite's low handling costs and stability in the blasthole indicates the low bank-shooting costs that can be achieved.

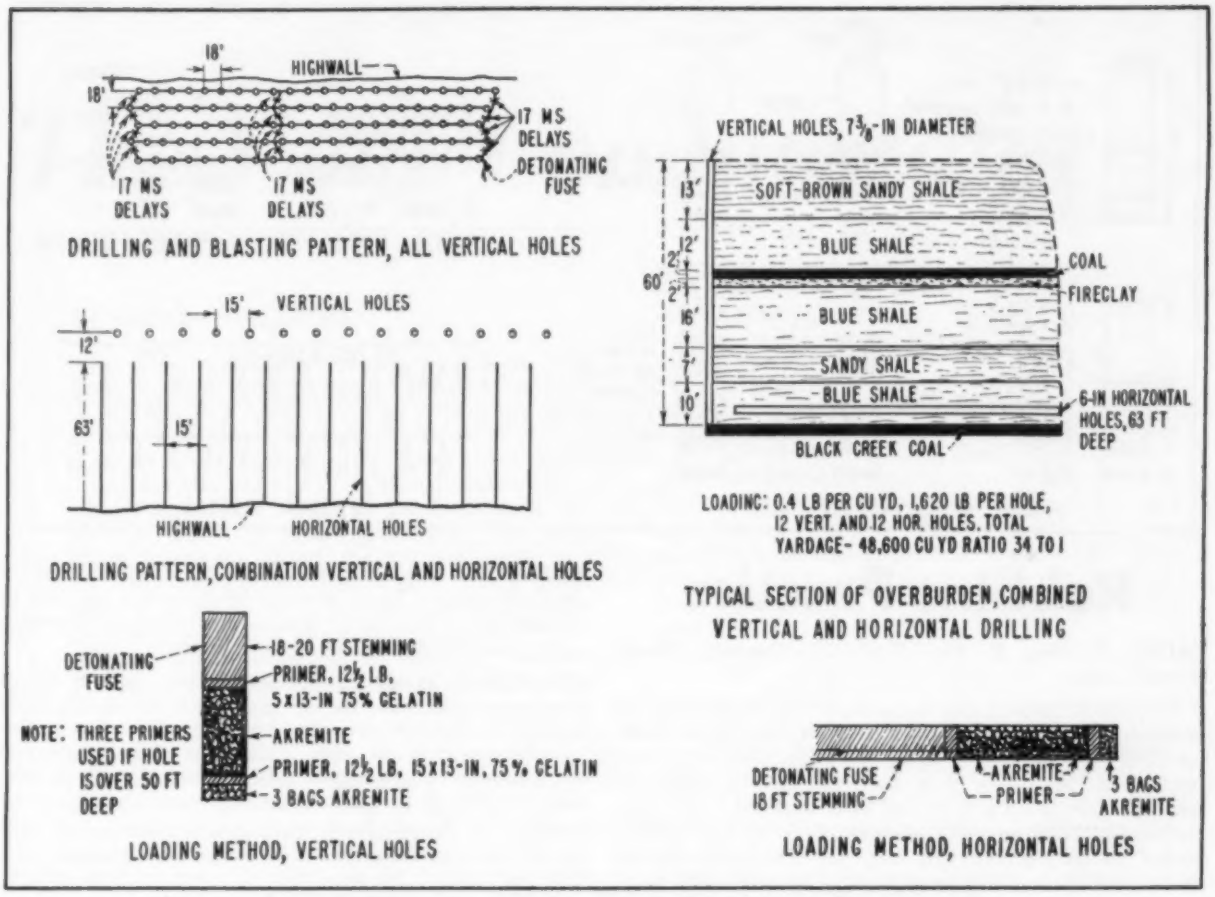
According to Mr. Lee, the cost to a licensed user who mixes his own Akremite should be approximately one-half the average cost of delivered fixed explosives. Maumee is exploring the possibilities of a licensing arrangement which will permit the industry to employ the Akremite blasting process in either of two ways: (1) purchase of low-cost Akremite-type package mixture from established explosive manufacturers, or (2) manufacture by the consumer himself.

Conventional loading techniques may be employed. Procedures in the use of detonators, detonating fuse, connections and delays are as normally employed with fixed explosives. Any number of holes may be charged as drilled and detonated as desired since the packaged mixture is stable and moisture-resistant. The mixture is contained in polyethylene sacks, thus providing the flexibility which permits the charge to fill the hole to the exclusion of energy-wasting air pockets.

Mixing and packaging of Akremite is a simple process not involving expensive equipment. A prime consideration is that the mixing plant should be close to the job to minimize haulage needs, and the stability of the materials and the finished mixture permits such location of the plant.

BETTER FRAGMENTATION INCREASES DRAGLINE SWINGS

Keeping accurate records of all phases of operation has become an operating habit at Maumee mines,



DeBardeleben Practice

MINE: Empire No. 6, DeBardeleben Coal Corp., Walker County, Ala.

SHOOTING RESULTS: A 25% increase in stripping rate resulting from good fragmentation plus heaving action of Akremite. Cost of breaking overburden cut to about half that of conventional explosives.

Akremite Used to Date

Month	Lb Akremite	Cu Yd Overburden Broken
Aug., 1954	20,000	65,000
Sept., 1954	84,000	270,000
Oct., 1954	90,000	240,000
Nov., 1954	69,000	155,000
Dec., 1954	42,400	141,000
Jan., 1955	86,920	269,000
Total	392,320	1,140,000

Quantity of Akremite per cu yd of material varied according to the proportion of sandstone and shale in the overburden. Standards for loading are as follows:

0.3 lb per cu yd....20% sandstone, 80% shale
0.35 lb per cu yd....20-30% sandstone, 70-80% shale
0.40 lb per cu yd....30-40% sandstone, 60-70% shale
0.50 lb per cu yd....50% sandstone, 50% shale

SEAM: Black Creek; average thickness, 22 in.

OVERBURDEN: Blue shales and hard sandy shales, up to 60 ft thick.

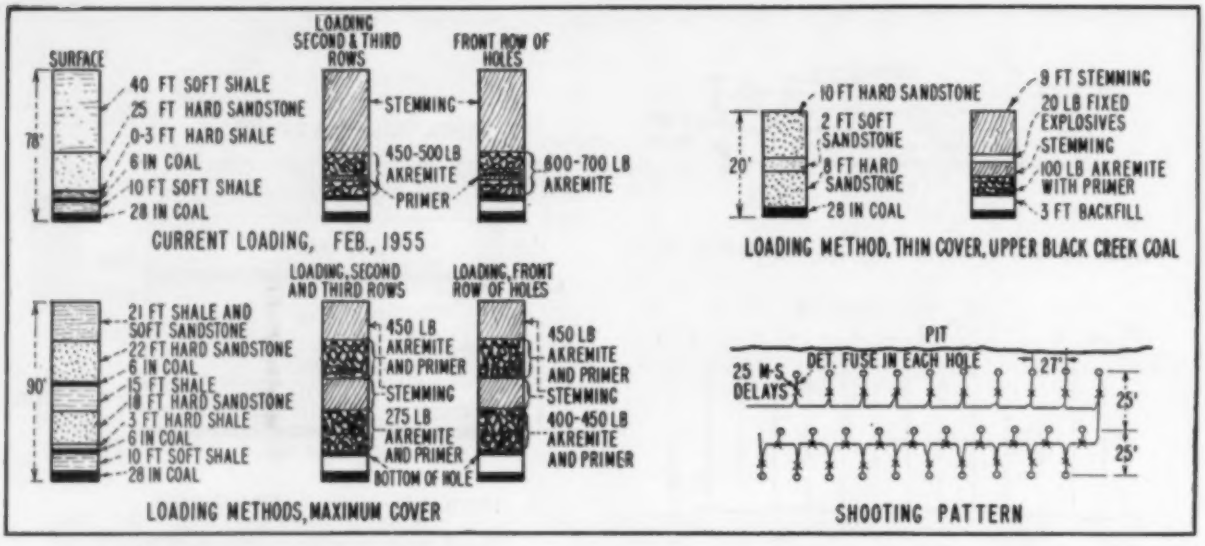
DRILLING: Combination of vertical rotary and horizontal, or vertical only, using Quarrymaster vertical and Joy-Sullivan horizontal units. Vertical holes, 7⅜ in on 18-ft centers; rows on 18-ft centers. Holes in diamond pattern. In combination blasting, vertical holes are bored on 15-ft centers at back of cut. Horizontal holes 6½-in diameter are centered between verticals and are drilled 63 ft deep, ending 12 ft ahead of vertical holes. Drilling patterns varied to meet changing conditions, with vertical holes predominating in hard material. Typical drilling patterns shown in diagrams.

Three drillers and blasters handle mixing job, usually two days per week, mixing about 12,000 lb per 7¼-hr shift. Remainder of time these men work with three other drillers.

CHARGING PLAN: Vertical—3 bags Akremite in bottom of hole; next, 12½-lb 5x13-in primer of 75% gelatin, followed by Akremite to within 20 ft of top of hole. Charge topped by second primer and remainder of hole is filled with stemming. If the hole is more than 50 ft deep, a third primer is used. Horizontal—3 bags of Akremite at back of hole; next, 12½-lb primer, followed by Akremite to within 18 ft of the mouth of the hole, a second primer and stemming to the mouth of the hole.

With all vertical holes, 60 to 80 are set off in one blast. If vertical holes are combined with horizontal, 25 horizontal and 25 vertical are set off together, or about the same number as previously set off in a blast with conventional explosives. Nine- and 17-ms delays are used with Primacord to detonate the charges.

ADDITIONAL BENEFITS: Lower stripping cost through better fragmentation and lower cost per lb of explosive.



Robbins Practice

MINE: Robbins, Robbins Coal Co., Oneonta, Blount County, Ala.

SHOOTING RESULTS: Removal of 20 to 30% of the overburden to the spoil area by Akremite alone, made possible by low cost of new explosive. Excellent fragmentation, permitting strip units to operate more efficiently. Hole spacing increased from 24x24-ft to 25x27-ft rectangles. With up to 2 ft of water in holes, have experienced no trouble, but wet holes are always shot within 8 hr after loading. Highwall sheared smoothly and more nearly vertical than when shot with conventional explosives. Less kickback or shattering of the highwall. Average consumption of Akremite is 1 lb per 2.67 cu yd of material removed.

SEAM: Black Creek, 28 in thick; and Upper Black Creek, 26 in.

OVERBURDEN: Hard sandstones and shales, ranging up to 90 ft thick.

DRILLING: Blastholes, 9-in diameter, drilled vertically on 27-ft centers. Three rows on 25-ft centers are shot in 75-ft-wide pit. Two men use a company-designed dry-type rotary unit for drilling on a two-shift basis.

CHARGING PLAN: Blastholes drilled through tough sandstone and shales to top of 10-ft layer of soft shale over coal. Akremite concentrated in sandstone as shown in accompanying diagrams. Front row of holes charged extra heavily (1 lb per 2 cu yd of material) so 20 to 30% of material will be thrown clear of pit and need not be handled by shovel. Deck loading used where shale separates sandstone. Second and third rows are charged with 1 lb per 3 cu yd. No more than 40 holes are fired at once, and 25-ms delays are used between holes.

MANPOWER: Two-man drilling crews handle all loading and blasting except for some help from an extra man, who spends about half a day with each crew 2 or 3 days per week.

ADDITIONAL BENEFITS: Easier loading than conventional explosives. No headache in handling. Danger of breaking Primacord less than with other explosives.

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where forbidding stripping ratios demand a high order of efficiency in all phases of operation.

Such records at Mine Nos. 20 and 27 show substantial increases in the number of dragline swings per hour of actual digging time since the change to Akremite was made. The stripping units are a 25-yd 1150-B at Mine No. 20 and a 30-yd 1250-B at Mine No. 27.

In the fiscal year ending Aug. 31, 1953 (before Akremite), the unit at Mine No. 20 averaged 80.34 cycles per hr of actual digging, and the one at Mine No. 27 averaged 75.99 cycles per hr.

In the first 6 mo of the present fiscal year (September, 1954, through February, 1955), using Akremite, the figures are 84.46 cycles per hr of actual digging at Mine No. 20 and 80.87 cycles per hr at Mine No. 27, or increases of 5.1% and 6.4%, respectively.

Overburden at Mine No. 27 averages 56 ft, consisting almost entirely of hard sand-shale and massive sandstone. Both banks are considered to be exceptionally hard, and a high degree of fragmentation is required for free digging by dragline.

SAFER SHOOTING IS POSSIBLE WITH AKREMITE

Since neither the materials nor the Akremite mixture is cap-sensitive, all are safer to handle, to store and to transport than are most other explosives. Furthermore, Maumee officials feel certain—although there has been no experience in the matter—that unshot Akremite in the bank will not constitute a hazard to digging. And the use of the primer package developed for use with Akremite eliminates the explosive headaches which sometime result from handling unwrapped gelatin dynamite.

"The results we have achieved with Akremite," Mr. Lee says, "have exceeded our expectations. . . . Therefore, we are licensing to other strip-mine operators the right to employ our Akremite methods at a modest figure which covers our instructions and training in compounding, packaging, handling, loading and shooting, and our continued advice and consultation."

The accompanying case histories describe the application of Akremite and provide results of its use at operations of Maumee Collieries in Indiana; DeBardeleben Coal Corp. and Robbins Coal Co. in Alabama; and the Colonial Coal Mining Co. in West Kentucky.

The Coal Commentator

Seven Years After

The nomination of James Krulcik, of Piney Fork, Ohio, to West Point is a vivid new indication of the fact that a career in coal mining can bring as full a measure of life's satisfactions and rewards as a career in any other industry. James is the son of Frank Krulcik, one of two U. S. coal miners whose jobs, prospects and aspirations were compared with those of miners in other countries in "The Coal Miner Round the World," in the May, 1948, issue of *Coal Age*. At that time, Frank was a cutter operator in the Piney Fork mine of the Hanna Coal Co., and was looking forward to a happy and prosperous career in mining. Now, with 23 yr of coal-mining experience behind him, he is an air-shooting man and still feels the same about mining as a life work. It is good to be able to report that for good men, such as Frank Krulcik, and for their families, such as Mrs. Krulcik, son James and daughter Patricia, coal mining continues to provide not only a good living but also a good share of the opportunities a free nation affords its citizens.

Things to Come

With the Mining Congress Coal Show, Cleveland, May 16-19, providing another opportunity to assess progress and analyze possibilities, a look at some of the things ahead in coal is in order. Here are three trends the *Coal Age* editors see as likely to materially affect coal's course in the next 2 to 5 yr:

1. A major increase in tons per face man underground as a result of new high-capacity continuous-mining and continuous-transportation equipment. **Outputs of 50 to 75 tons per man at the face will be fairly common within 2 or 3 yr, and 100 tons per man at the face is in sight now at an increasing number of mines.**

2. **The average thickness of overburden handled at strip mines will increase 10 to 15 ft in the next 5 yr as a result of new equipment with a greater range, increased use of peak-knocking units and more spoil haulage.** Improvements in drilling and blasting agents will help keep costs at present levels.

3. **With the new importance of fine coal providing a major part of the impetus, equipment and processes from abroad will show up more and more in preparation to supplement equipment and processes developed here.** Fixed screens and centrifuges with screen agitators from abroad, and shakers with built-in mechanisms providing a combination of vibrating and shaking characteristics developed here, are examples.

How They See It

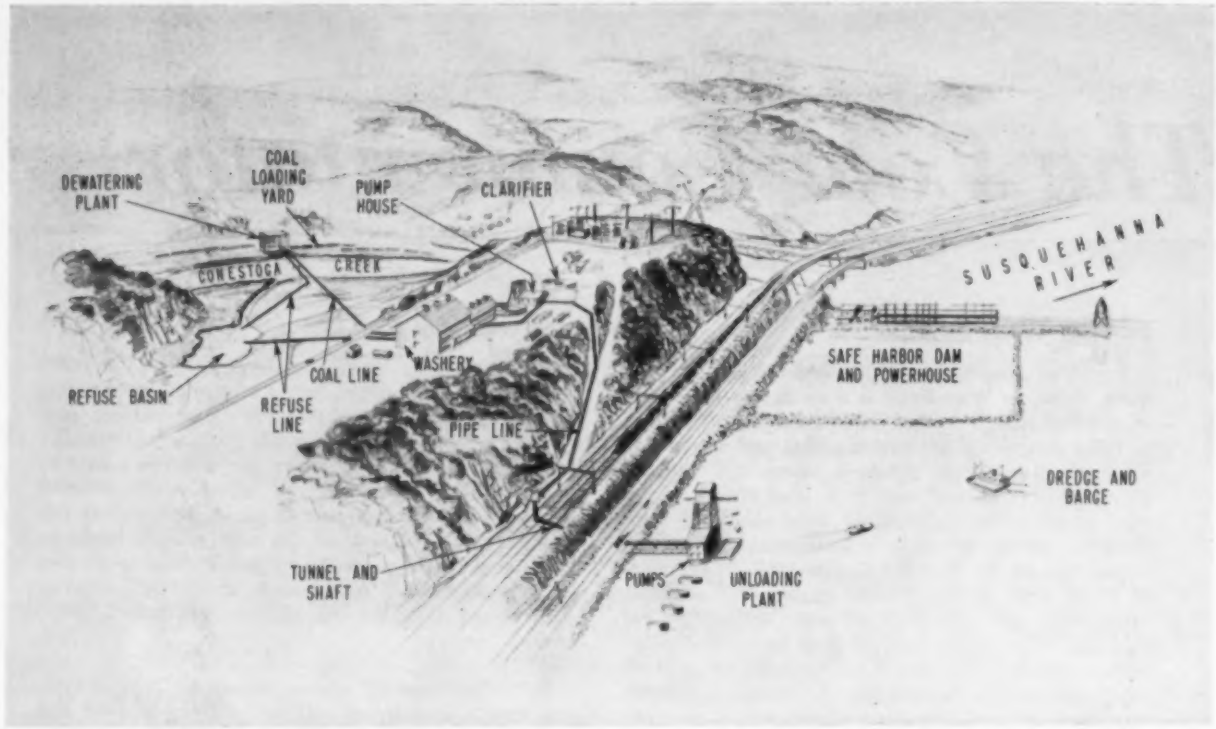
"For the first time during peace, the sales price which an independent producer of any product may receive for a commodity competitively produced and competitively sold is given a public-utility status subject to regulation by a federal agency because the commodity is subsequently shipped across a state line. **There is grave danger that this same type of control, for the same reason, could be extended to all competitively produced commodities and products of farm, forest and mine.**"—Phillips Petroleum Co., on natural-gas regulation, 1954 annual report.

"In contrast to ever-increasing imports, domestic production of oil has suffered serious and repeated setbacks in 1949, 1950, 1953 and 1954 . . . Denied its place in the growing market, the domestic oil industry is producing at only three-fourths capacity. **This curtailment of production means less income—and ultimately less drilling and less development of new oil reserves. In short, it means less security for America.**"—Independent Petroleum Association of America.

Progress Report

"Ten years of work by the Locomotive Development Committee has shown that the gas turbine can burn coal and that blade erosion can be prevented by the effective removal of coarse ash particles. The 1955 program will show just how nearly the committee has attained its goal of a practical road locomotive which can actually accomplish the economies which are inherent in low-cost abundant bituminous coal."—John I. Yellott, director, and Peter R. Broadley, assistant director of research, Locomotive Development Committee, in a special report for the 1955-56 edition of *Keystone Coal Buyers Manual*.

Developing the economy theme, Messrs. Yellott and Broadley point to the possibilities inherent in coal under ⅜ to ⅛ in, which is widely available at the mines at prices under 15c per million Btu, compared to 80c for diesel fuel to railroads. For a 4,500-hp turbine locomotive, freight service, 84,000 mi per year, 50% load factor, the annual fuel bill with ⅜x0 coal would be $20,000, compared to $60,000 for a diesel. Your commentator also notes that the solutions to ash and other problems apparently are in sight. **Expect, therefore, a return of coal to the locomotive field—possibly starting within the next 3 yr.**



PENNSYLVANIA WATER & POWER CO. employs economical pipe-line transportation among widely scattered units of recovery plant, where terrain limitations dictated this layout. Distance between washery and dewatering plant is 4000 ft.

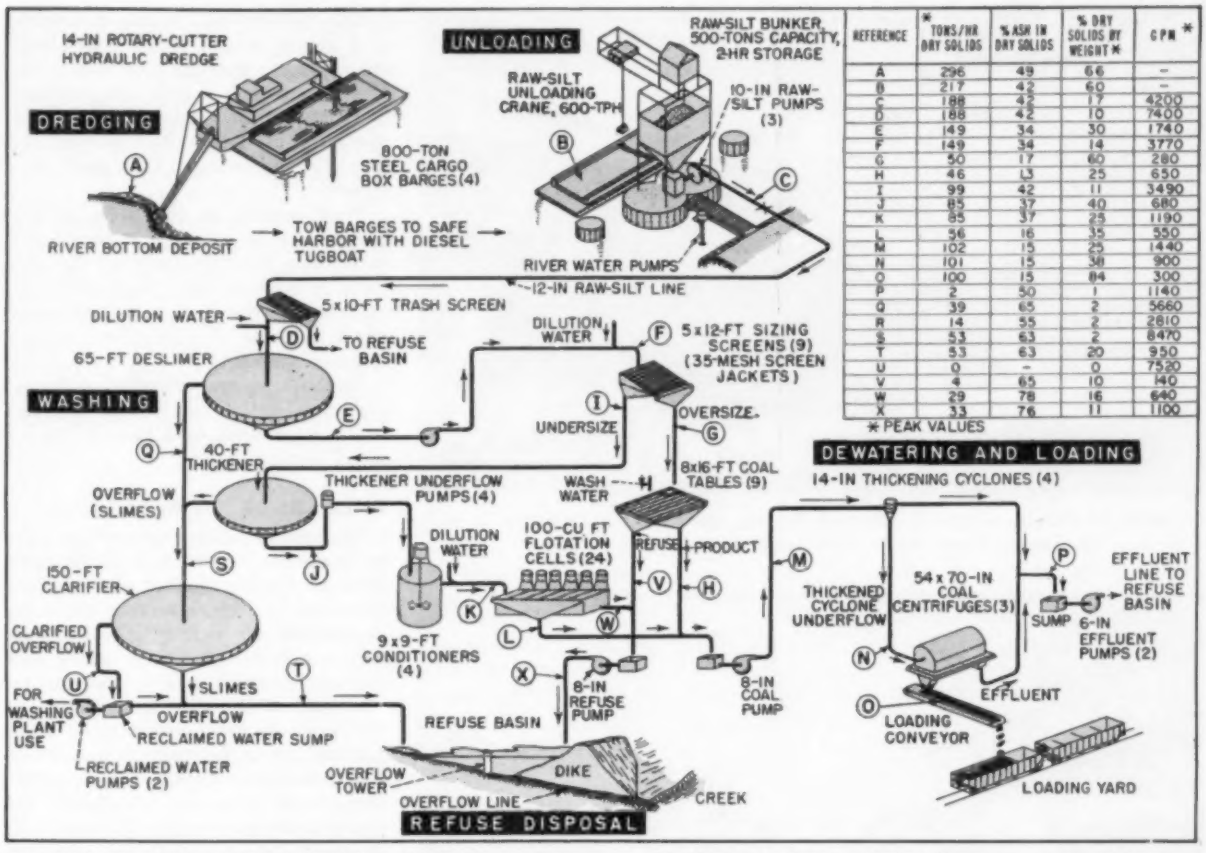
Recovering River Coal

Modern flotation-and-tabling washery cleans anthracite fines recovered from Susquehanna River deposits at Safe Harbor, Pa. Pipe-line transportation of feed, refuse and clean coal solves handling problems.

THE CONESTOGA COUNTRYSIDE near Lancaster, Pa., home of the famous freight wagon of pioneer days, boasts another engineering marvel in the fine-coal recovery facilities of the Pennsylvania Water & Power Co. at Safe Harbor, Pa., on the Susquehanna River. There is nothing quite like this

HYDRAULIC DREDGE recovers coal-bearing silt from maximum depth of 45 ft and discharges to barge on each side.

UNLOADING CRANE transfers material from barges into 450-cu yd bunker to feed washery.



REFERENCE	* TONS/HR DRY SOLIDS	% ASH IN DRY SOLIDS	% DRY SOLIDS BY WEIGHT *	GPM *
A	296	49	66	–
B	217	42	60	–
C	188	42	17	4200
D	188	42	10	7400
E	149	34	30	1740
F	149	34	14	3770
G	50	17	60	280
H	46	13	25	650
I	99	42	11	3490
J	85	37	40	680
K	85	37	25	1190
L	56	16	35	550
M	102	15	25	1440
N	101	15	38	900
O	100	15	84	300
P	2	50	1	1140
Q	39	65	2	5660
R	14	55	2	2810
S	53	63	2	8470
T	53	63	20	950
U	0	–	0	7520
V	4	65	10	140
W	29	78	16	640
X	33	76	11	1100

* PEAK VALUES

FLOTATION CELLS AND SHAKING TABLES produce up to 570,000 tons of clean anthracite per year for 100,000-kw steam-electric station at Holtwood, 8 mi down-river. Susquehanna watershed includes about 80% of anthracite region.

in the industry, because the anthracite, which fuels the company's Holtwood generating station, is reclaimed from river deposits in back of the power company's dam. The dam serves the Safe Harbor hydroelectric plant, 8 mi up-river from Holtwood.

Operating around the clock for 9 mo of the year, the plant produces about 570,000 tons per year of anthracite averaging 16% ash, 18% final moisture and 10,000 Btu per lb, heating value. River ice prevents operations for 3 mo.

DIESEL-POWERED TUGBOAT can propel two 800-ton barges in tandem.

The raw material is drawn from about 80% of the anthracite region drained by the Susquehanna and its tributaries, and deposition of fine coal is expected to continue for some years in view of the large volume of such fines already exposed to the drainage system. The projected life of the plant is 35 yr.

The eye-catching facilities include:

1. **Modern floating units** consisting of a dredge, a fleet of barges and a tugboat provide efficient means for raising the river-bottom material and transferring it to the shore.

2. **An unloading station,** near the shore, is equipped with a clamshell barge-unloader and a hopper, among other facilities.

3. **The washery on top of a nearby hill** is designed for recovery by froth flotation and tabling. Tributary equipment at the washery includes a 150-ft clarifier, a 65-ft desliming classifier and a 40-ft thickener, along with the pumps and motor-control centers.

4. **A dewatering plant,** 4,000 ft from the washery, employs cyclones and centrifuges for final dewatering. The product is loaded into railroad cars at the dewatering plant.

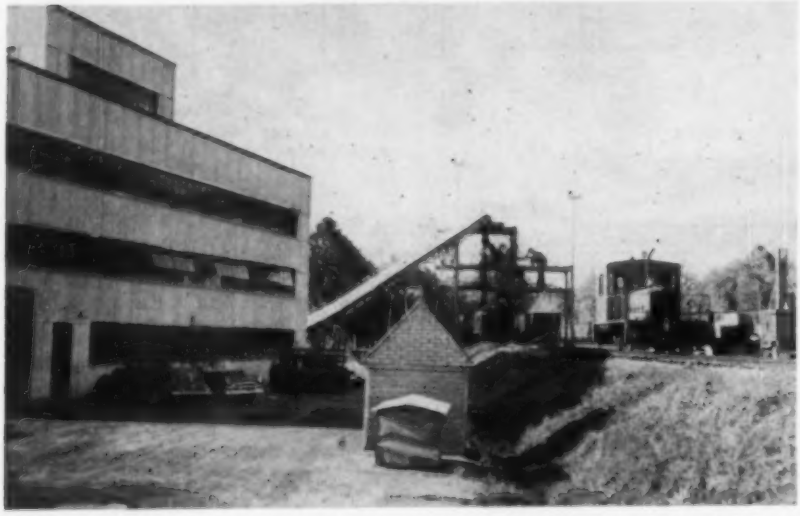
5. **A nearby refuse-disposal area** will serve the plant throughout its life, calling for the progressive construction of a refuse dam that eventually will be 275 ft high.

Paul Levin, senior engineer, Pennsylvania Water & Power Co., was project engineer for his company. Western-Knapp Engineering Co. handled the design and construction of all shore installations except the loading yard, and Dravo Corp. designed and built the unloading station. The loading yard was designed and built by power-company personnel, who also acted as prime contractor for the floating equipment.

WATER-BORNE OPERATIONS

The floating dredge is designed to bring up the bottom material from as far as 45 ft below the surface of the water through the combined action of a rotary cutting head and the intake capacity of a 14-in pump. The pump is direct-driven by a 350-hp diesel engine and has a rated capacity of 420 cu yd per hr.

SOLIDS RATIO in slurry is adjusted for various steps of recovery in 40-ft thickener (foreground), 65-ft deslimer and 150-ft clarifier.



LOADING CONVEYOR transports coal from centrifuges in plant at left to flexible chute system in tower where one man monitors car loading.

The raw material is raised directly to a rotary screen which scalps and returns to the river the plus ¾-in trash. The stream then is split and run into two barges, one on each side of the dredge. The barge fleet consists of four 800-ton units, all of steel construction.

Weir boards at the ends of the barges may be adjusted to permit excess water to drain away as the material is loaded. This large-scale decantation provides an initial cleaning effect because the overflow carries some of the slimes.

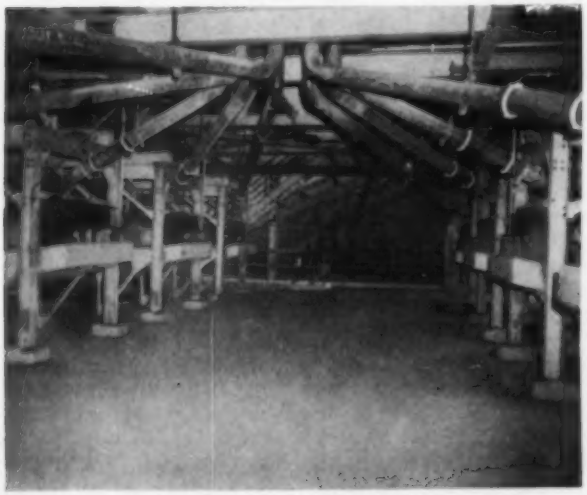
The barges are propelled and maneuvered by a 50-ft-long tugboat which is powered by a pair of 215-hp diesel engines.

UNLOADING THE BARGES

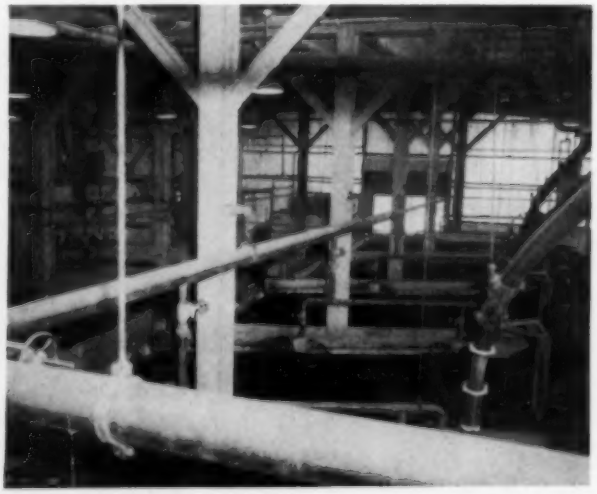
The wharf which receives the loaded barges is located 115 ft off shore in order to clear the toe of a railroad fill which extends down into the river. It consists of a line of cylindrical cells constructed of sheet piling and filled with sand and rock down to the solid rock of the river bed. There are four cells 20 ft in diameter on 65-ft centers on each side of a pair of skin-to-skin cells 35 ft in diameter. The larger cells form the foundation for the unloading facilities. The cells are designed to withstand the push of river ice without external support such as guy lines.

The unloading device is a 4½-cu yd clamshell bucket discharging 500 tph into a 450-cu yd hopper within the tower structure. The material is flushed out of the hopper into a raw-silt sump to feed the pumps which force the slurry up to the washery level, 275 ft above the river.

Three 10-in raw-silt pumps are ar-



MINUS 35-MESH through vibrators is collected in 40-ft thickener. Overproduct of each is fed to separate table.



NINE COAL TABLES clean the 10x35M fraction. Coal and refuse are sluiced to lower-level sumps.

ranged in series, each contributing 50 psi to the 150-psi total head required to force the slurry up through the 12-in line at a pipe-line velocity of 12 fps. River-water pumps provide the necessary transportation water. A duplicate set of raw-silt pumps is maintained in readiness to take over the job when inspection or repair of the operating set becomes necessary. In fact, all slurry pumps have been installed in duplicate.

The route of the 12-in line from the raw-silt pumps to the washery is crossed by two busy railroad tracks, one skirting the shore and the other 65 ft higher up on the hillside. The lower track was passed by laying 16-in pipes in a reinforced-concrete slab under the track, then passing the slurry, water and power lines through the 16-in openings. A tunnel and shaft were constructed to by-pass the higher track, with the tunnel portal at the lower track and the shaft collar at the elevation of the upper tracks. From the shaft collar to the top of the hill the pipelines are laid on a sidehill ramp.

As a precautionary measure the line at its low point is equipped with a dump valve which opens when the line velocity is reduced to a predetermined limit, as the result of a pump stoppage, for example. The contents of the line then would drain back into the river, preventing blinding of the line. Furthermore. the 12-in line is paralleled by a 4-in line carrying high-pressure river water down from the washery for various uses. Outlets have been installed at 200-ft intervals in the 4-in line to permit flushing of the solids line in the event of blockage. The dump valve is the primary protective device, however.

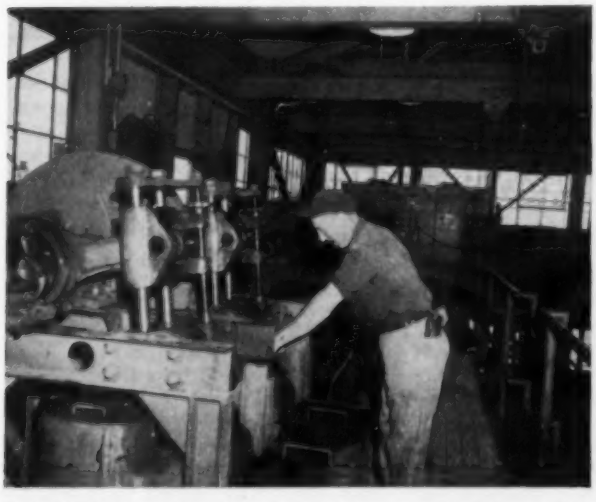
River Coal Plant—Engineering Features . . .

- Some of the concrete work was done by Intrusion-Prepakt methods, developed by Intrusion-Prepakt, Inc., Cleveland, in which graded aggregate is packed into forms then cemented by pumped-in mortar. The result is a dense, uniform concrete, and the aggregate need not be handled in the mixing operation. Portions of the walls of the tunnel and shaft which by-pass the railroad tracks were formed in this manner.
- Support piling under the centrifuge building also was fashioned by Intrusion-Prepakt. An air-powered auger drilled 12-in holes down through the 12- to 15-ft layer of alluvium to solid rock. Aggregate was packed in around a central grouting pipe, then the pipe was withdrawn with the rising mortar. The building rests on 62 of these piles.
- Prepakt concrete piling also forms one shore abutment and the footing for the center pier of the pipeline bridge crossing Conestoga Creek near the centrifuge building. The two 100-ft trusses of the bridge were assembled on shore and set into place by cranes.
- Floors in the washery building consist of 12-in reinforced concrete and steel members are extra-heavy in order to withstand vibration. To save time, trouble and expense in handling heavy machinery, most of the washery units were suspended from the structural members of the building before the floors were poured, then were lowered into place after the concrete had set.
- Wherever possible, monorail hoists have been installed to facilitate the handling of heavy equipment, such as pumps, centrifuge bowls and so on.
- Shore units are inter-connected by telephone and public-address equipment, and floating units are tied in through two-way radio link.
- The three shore buildings and the dredge and tugboat are equipped with modern changeroom and shower facilities. Changerooms and offices in the shore buildings have radiant-heating lines in the floor slab, and operating floors are heated by fan-type space heaters.
- The 4,200-hp shore load is served through five unit substations, equipped with four 1,000-kva and one 750-kva transformers. The largest motors are the 250-hp drives of the raw silt pumps.

CLEANING RIVER COAL

The flotation-and tabling plant at the top of the hill features circuits and equipment designed to adjust the solids-content of the slurry for best performance in cleaning and pumping. The flow is as follows:

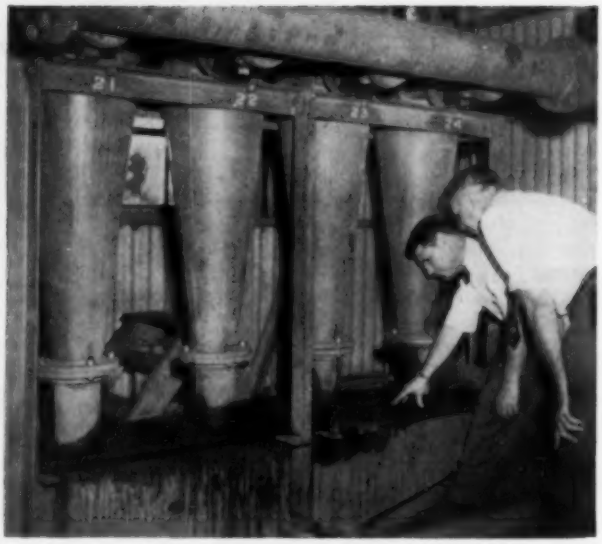
The 12-in line discharges to a 5x10-ft Ripl-Flo trash screen where any oversize or other foreign material which has escaped the rotary screen on the dredge is removed. Underflow of the screen, containing the values, is directed to a 65-ft desliming classifier which overflows minus 200-M slimes to remove these from the prep-



DIAPHRAGM PUMPS raise thickener underflow (40% solids) into 9x9-ft flotation conditioners for treatment.

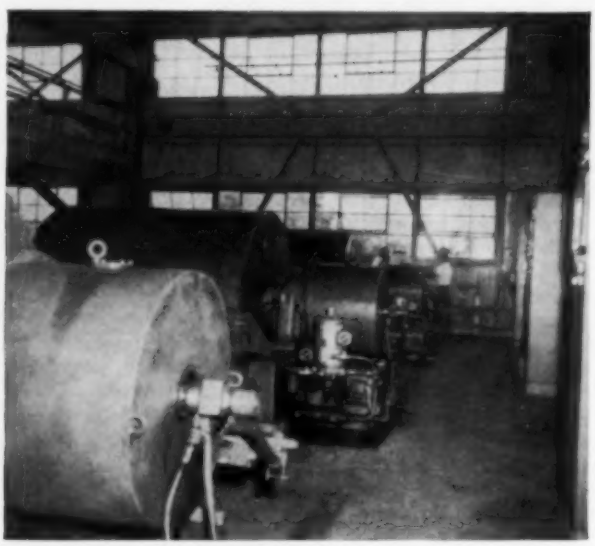
FOUR BANKS OF FLOTATION CELLS are installed for straight series operation, that is, no recirculation.

CLEAN COAL AND REFUSE PUMPS are installed in duplicate, like other solids pumps, to insure steady service.



EIGHT CYCLONES at dewatering plant thicken clean-coal slurry which is pumped down from the washery.

FEED DISTRIBUTOR receives thickened underflow of cyclones and serves equal loads to three centrifuges.



DEWATERING CENTRIFUGES, equipped with overload-relief devices, discharge coal with moisture content of 18%.

aration circuits. The underflow of the deslimer, containing the values, is pumped by a 6-in pump to the screen floor in the main washery building.

The deslimed raw silt is pumped into a Deister revolving feed distributor which splits the material among nine 5x12-ft Allis-Chalmers Low-Head vibrating screens, dressed with 35M cloth. Overproduct of each screen is washed directly to a separate 8x16-ft Deister SuperDuty diagonal-deck table where the plus 35M material is cleaned to a product having 13% ash.

Underflow of the nine vibrating screens is collected in a 40-ft. Wemco thickener where preparation of the flotation feed begins.

The overflow of the thickener joins the overflow of the 65-ft deslimer and the combined stream is directed to a 150-ft clarifier. The underflow of the thickener, at 40% solids, is raised into the flotation circuit by four 6-in duplex diaphragm pumps which discharge into separate 9x9-ft Wemco conditioners. Conditioning time is about 15 min, somewhat longer than usual because the surfaces of the coal particles have been adversely affected by long association with the slimes.

Each of the four conditioners feeds a bank of six 100-cu ft Denver-Fahrenwald flotation cells. The cells in each bank are in straight series arrangement; there are no provisions for recirculation.

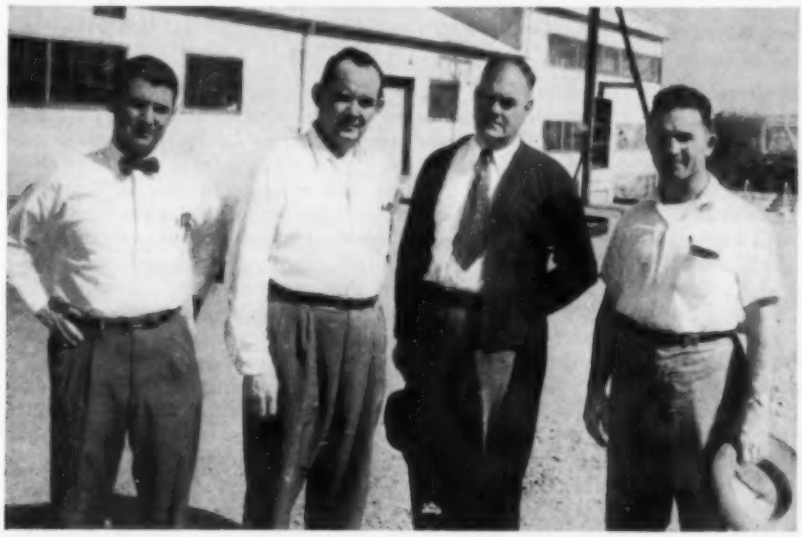
As shown in the flow diagram, refuse from both cleaning circuits is collected in a sump for final disposal. Clean coal is combined in the coal sump which serves as a feed reservoir for the dewatering plant.

All solids-handling pumps are furnished by Barrett-Haentjens, and all water pumps by Worthington. The solids pumps are equipped with Ni-hard or high-chrome impellers and casings.

DEWATERING AND LOADING

The best available site for loading the coal proved to be a level area on the bank of Conestoga Creek, 4,000 ft away from the washery and 300 ft lower in elevation. Therefore, it was decided to transport the coal in its own process water to the loading point and dewater it there immediately prior to loading.

SANDY REFUSE is settled out in berms atop refuse dam to provide material for increasing the height of the dam. Unstable slimes are discarded at back end of refuse basin. Right photo shows downstream face of dam.



SUPERVISORS—Paul Levin (left), project engineer; J. P. Ledvina, coal-results engineer; E. S. Hill, supt., coal production; K. J. Krach, asst. supt.

Dewatering consists of passing the clean-coal slurry through a battery of eight 14-in Heyl & Patterson cyclones. The thickened underflow of the cyclones then is proportioned by a Diester revolving feed distributor among three 54x70-in Bird solid-bowl centrifuges which discharge the dewatered cake directly onto the loading conveyor.

The 24-in belt conveyor elevates the coal to the loading tower. The operator from his cab in the tower selects the proper chutes for loading on either of two loading tracks or for transferring the loading from a loaded car to a following empty car without spillage. The car-spotting hoist also is remotely controlled by the operator in the tower.

The loading yard contains 14,000 ft of track, enough for 185 cars, and is connected to the Pennsylvania R.R. by a spur track. Cars are hauled in the storage yard by a 25-ton diesel hydraulic locomotive.

REFUSE DISPOSAL

Even though the raw material is taken from the river bottom, the waste solids cannot be returned to the river, under Pennsylvania's clean-streams program. Once the solids reach the shore the Pennsylvania Water & Power Co. becomes responsible for disposing of them in such a manner that run-off from the disposal area meets state specifications.

The waste products are of three different types. Flotation and table refuse is primarily sandy; the underflow of the 150-ft clarifier is fine-grained slimes; and effluent of the dewatering plant contains very little solid matter, although enough to require treatment.

The disposal area is constructed in a valley midway between the washery and the dewatering plant. A base of crushed stone was laid down as a drainage blanket across the mouth of the valley and a 50-ft high earth dam was built on this base, using material borrowed from the basin behind the dam. A 5-ft concrete run-off pipe was laid under the dam to carry away clarified water which is drawn from the top of the pool through a standpipe.

Sandy waste from the cleaning units is deposited in small basins constructed near the top of the dam. As the solids settle out they are used to increase the height of the dam. The slimes from the 150-ft clarifier and effluent of the dewatering process are deposited in the main settling basin behind the dam.

As much as 500,000 cu yd of material is to be deposited each year in the refuse basin. As previously mentioned, the ultimate height of the dam will be 275 ft, providing storage room for some 20,000,000 cu yd of plant wastes. The sand is spread on the dam by scraper and is compacted by a bulldozer on a slope of 3 on 1 on the downstream face of the dam.

The major concern in construction of the disposal dam was to achieve stability of the structure in view of the fine-grained nature of the material. Accordingly the consulting assistance of Dr. Arthur Casagrande, soil-mechanics expert, Harvard University, was solicited in this phase of the work.

The 1955 Coal Show . . .

Opportunity for Mining Progress

L. C. CAMPBELL, Chairman, Coal Division

COAL, our country's No. 1 energy source and a foundation stone of the Nation's economy, is presently beset with a number of difficulties. Some are peculiar to the coal industry, but most are the result of the intense competition growing out of the changing fuel economy of the age in which we are living. But as we move to mobilize our resources to better meet and eliminate these problems, we can look forward to more and more help from an increasing public and consumer appreciation of the value of coal, in bringing about better days for the coal industry.

More-effective mobilization has its goal raising coal's stature, increasing its use and warding off unfair competition by making its values clear to legislative bodies and governmental agencies, the general public, and the consumer—actual and potential. More and better research, harder-hitting governmental and public-relations programs, sound employee-relations policies and modern merchandising are among the tools. But mobilization requires a sound base. With coal it is a low-cost high-quality product produced under conditions to maximum safety.

Cost, quality and safety, in fact, were never more important than today. They are the keynotes of the 1955 Mining Congress Coal Show. The Coal Show means a new opportunity for progress in coal mining. I urge you to come to Cleveland, attend the technical sessions, study the exhibits, and exchange ideas with other mining men and manufacturers. As you apply what you will learn, you will be making sure that the American coal industry will continue to maintain its world leadership in the output of a primary natural resource as vital to modern civilization as air and water.

HUGH B. LEE, Chairman, Program Committee

NEW METHODS, new equipment, new materials and new ideas for safe, efficient coal production and preparation will keynote the technical sessions at the 1955 Mining Congress Show in Cleveland. The program will feature mining men of recognized ability in a down-to-earth discussion of problems, possibilities and advances in cost reduction, quality improvement and safety. These are among the reasons why your program committee believes you will receive real benefits from the technical sessions, and why it urges you to come, listen and take part.

Ten sessions will cover continuous mining, mechanical mining, roof support, strip mining, foremanship, maintenance, haulage, power, coal preparation and safety. A sampling of the topics includes service haulage for continuous mining, longhole mining of pitching coal, latest developments in roof-bolting, the wheel excavator in stripping, preventing machine breakdowns, industrial engineering in coal mining, a new blasting system for strip mining, AC and DC for underground power, evaluating foremanship, cleaning and drying fine coal, augering in correlation with deep and strip mining, mechanical mining in thick and thin seams, and a panel discussion of accident prevention in coal mines with eight participants.

Whatever your job in coal mining, the program has something definite for you—something specifically designed to help you not only with your day-to-day problems but in planning for the future. Check the program and reserve time now for the technical sessions. I can promise you that you will come away well supplied with useful and useable material for both present and long-range applications—material that will benefit you as well as coal.

J. W. OVERSTREET, Chairman, Manufacturers' Division

WE THE EXHIBITORS at the 1955 Coal Show—more than 225 of us—extend you a warm and cordial invitation to come to Cleveland, see our products and services, and avail yourself of our time and talents in solving your mining, preparation and safety problems. We will have over $5 million worth of equipment and operating supplies on hand for you to study, and our representatives will welcome the opportunity of explaining, demonstrating and advising on applications and benefits.

The 1955 Coal Show will feature everything from the largest coal stripper to the smallest supply item. Here is your chance to see, study and compare. If it is continuous miners, all the manufacturers will be on hand to show you what they have, talk it over with you and make available the services of their experts. If it is lubricants, at least eleven companies will have products and specialists on hand. Need a transit, some aerial surveying, or a flotation reagent? They will all be there, along with everything else used in mining preparation and safety.

I urge, therefore, that you come to Cleveland and take full advantage of this new Coal Show opportunity. Think about your needs for equipment, materials and services and plan to check on these specifically. Plan also to take a look at everything, since an answer to a problem might turn up where you least expect it. Every exhibitor will be at Cleveland because he has something to help the coal industry, and he wants you to make the most of this opportunity to check on developments designed to help in cutting cost, raising product quality and promoting safety. Come and see us with your problems. We will welcome the opportunity of helping you solve them.

The 1955 Coal Show . . .

What the Program Offers

MONDAY MORNING, MAY 16

Continuous Mining

Basic Requirements for Successful Continuous Mining—K. L. Konnerth, consultant.

A Complete Continuous Mining System—F. Earle Snarr, Chicago, Wilmington & Franklin Coal Co.

Maintenance of Continuous Mining Equipment—Wm. E. Hess, Vesta-Shannopin Div., Jones & Laughlin Steel Corp.

TUESDAY MORNING, MAY 17

Mechanical Mining

Mechanical Mining in Thick Seams—R. J. Bowen, Columbia-Geneva Steel Div., U. S. Steel Corp.

Mechanical Mining in Thin Seams—A. H. Mandt, Stephens Elkhorn Fuel Corp.

Mechanical Mining and Longhole Drilling in Pitching Seams—G. A. Schnee, Philadelphia & Reading Coal & Iron Co.

Maintenance Cost Accounting—Hanna Coal Co., Div. Pittsburgh Consolidation Coal Co.

Roof Support

Latest Developments in Mine Roof-Bolting—E. M. Thomas, Roof-Control Section, U. S. Bureau of Mines.

Methods and Results With Mine Roof-Bolting—E. H. Greenwald, Boone County Coal Corp.

Methods of Partial and Complete Pillar Extraction—W. F. Diamond, Island Creek Coal Co.

Auger Drilling Pillars to Control Mountain Bumps—Woods G. Talman, Coal Div., U. S. Steel Corp.

TUESDAY AFTERNOON, MAY 17

Strip Mining

Two-Seam Stripping and Overland Belt Haulage—Wm. W. Dukes, Stonefort Corp.

The Truax-Traer Wheel Excavator—Gene Long, Truax-Traer Coal Co.

New Improved Truck Designs to Raise Haulage Efficiency—H. A. Ravio, Caterpillar Tractor Co.; R. H. Kress, Dart Truck Co.; A. S. McClimon, Euclid Div., General Motors Corp.; and Hoyt W. Smith, LeTourneau-Westinghouse Corp.

WEDNESDAY MORNING, MAY 18

Foremanship Maintenance Cost Control

An Evaluation System for Foremanship and Its Uses—E. B. Leisenring Jr., Stonega Coke & Coal Co.

Machine Breakdowns Can be Prevented—Hugh H. Fraser and H. E. Hastings, H. H. Fraser & Associates and Fraser, Weir & Associates.

Industrial Engineering Applied to Coal Mining—T. M. Barry, Barry & Co.

Haulage and Power

Considerations in Designing a Mine Haulage System—Stephen Krickovic, Eastern Gas & Fuel Associates.

Shuttle-Car Haulage With Conventional Mining—W. L. Husk, West Kentucky Coal Co.

Mechanical Mining on Bridge Conveyors—Myron Kok, Warner Collieries Corp.

Mechanical Loading Directly Into Mine Cars—Joseph Johnson and John B. Harvey, Perry Coal Co.

Use of AC and DC for Underground Power—W. R. Morton, General Electric Co.

WEDNESDAY AFTERNOON, MAY 18

Strip Mining

Latest Anthracite Strip Drilling Practices—J. Robert Bazley, J. Robert Bazley, Inc.

New Drilling Developments in Bituminous Strip Mining—Forbes Clark, United Electric Coal Cos.

The Akremite Blasting Process for Strip Mining—J. A. Miner, Colonial Coal Mining Co., Inc.

Auger Mining Correlated With Strip and Deep Mining—Fred O. See, Cardox Corp.; J. M. Poindexter, Salem Tool Co.; and Quentin G. Bullock, Compton, Inc.

THURSDAY MORNING, MAY 19

Continuous Mining

Continuous Mining in 42-In Coal—R. T. Todhunter Jr., Barnes & Tucker Co.

Pillar Extraction With Continuous Mining—H. A. Quenon, Eastern Gas & Fuel Associates.

Extensible Conveyors in Continuous Mining—M. A. Williams, Saginaw Dock & Terminal Co.

Portable Surge Cars in Continuous Mining—W. C. Campbell, Old Ben Coal Corp.

Continuous Mining With AC Power—John A. Stachura, Enoco Collieries, Inc.

Coal Preparation

Preparing Fine Coal From the Illinois No. 6 Seam—Emery Milligan, Freeman Coal Mining Corp.

Processing Small Sizes for Competitive Fuel Markets—J. S. Snyder and J. E. Tobey Jr., Blue Diamond Coal Co.

Cleaning and Drying Fine Sizes of Pittsburgh Coal—David G. Werner, Mathies Coal Co.

Anthracite Recovery From Silt Deposits and Jeddo-Highland—H. R. Middleton, Wilmot Engineering Co.

THURSDAY AFTERNOON, MAY 19

Safety Panel

Accident Prevention in Coal Mines—M. J. Ankeny, Bituminous Coal Operators' Association; James B. Benson, Southern Coal Producers' Association; H. T. Batman, Lynch Coal Operators' Reciprocal Association of Indiana; J. J. Forbes, U.S. Bureau of Mines; Edward Steidle, Federal Coal Mine Safety Review Board; Charles B. Ferguson, United Mine Workers of America; and Thomas Allen, Colorado state mine inspector.

SPECIAL EVENTS

Annual Meeting, Manufacturers' Div., Monday Afternoon.

Coal Miners' Party, Wednesday Evening.

The 1955 Coal Show . . .

Equipment Preview

This roundup of the mining machinery, equipment and supplies you'll see at the 1955 Coal Show is for your use before you go to Cleveland.

For your convenience, manufacturers' exhibits are classified by product, new items are highlighted, and booth numbers are given after company names. Check it for things that interest you and save time and footwork later.

Mechanical Loading

Goodman Mfg. Co. (2642)—Goodman Type 865 loading machine.

NEW—Type 965 loader, latest in Goodman line of off-track loading machines and designed for low coal seams. Features include tramming height of only 27 in; sturdy construction and high capacity for profitable application in both development and full production work; and moderate initial cost.

Jeffrey Mfg. Co. (2743)—NEW Jeffrey 81-A loader, a high-production crawler-mounted loading machine.

Joy Mfg. Co. (2525)—Joy loading machines.

Myers-Whaley Co., Inc. (1407)—"Whaley Automat" loading machines.

Continuous Mining

Clarkson Mfg. Co. (1519)—NEW Marietta continuous mining machine.

Goodman Mfg. Co. (2642)—NEW Goodman Type 400 continuous miner, one of a series of Goodman boring-type units, which cuts and loads from the solid seam at a rate upwards of 6 tpm, providing a continuous advance without swing or maneuver. Available for cutting heights of 6-ft minimum (width, 11 ft 10 in) to 7-ft maximum (width, 12 ft 10 in). Unit features retraction of cutting units for tramming clearance at top, bottom and sides.

Jeffrey Mfg. Co. (2743)—"Colmol" continuous mining machines, Models 76-AM and 76-B.

NEW—Jeffrey 34-F mining machine, a continuous-type mining unit utilizing cutting bars and vibrating hammers.

Joy Mfg. Co. (2525)—NEW complete mining systems for high and low coal, including: a new continuous miner with twin boring arms and shaped cutter chains; continuous mining system consisting of a new 1CM-2 continuous miner and new Joy extensible belt conveyor connected by flexible bridge conveyor for continuous high-capacity production and transportation from face to main haulage up to 1,000 ft; and an adaptation of the 1CM-Ex-B mining system, using a modified 20-BU loader for continuous loading and haulage in low coal.

Kennametal, Inc. (739)—Continuous-miner bits for all types of machines.

Lee-Norse Co. (318)—NEW Lee-Norse CM36X crawler-mounted miner for seams 42 to 84 in high, featuring Lee-Norse "Pattern Cutting" for removing coal from the solid and including the latest field-tested improvements.

Long Co. (600)—Long "Piggyback Conveyor Continuous Haulage Mining," using Model 88 "Pigloader," PT-15 Piggyback conveyor and Long room conveyor.

Mining Progress, Inc. (224)—NEW "Westfalia Conversion Equipment" for fully mechanical coal getting, based on the original Löbbe Hobel "German Coal Plow" but utilizing separate drives for conveyor and plough. It can be installed on Types PFI and PFO "Westfalia Panzer Conveyors," with return or intermediate drives fitted at any point of conveyor to permit ploughing in faulted areas with one or more plough bodies.

Salem Tool Co. (1107)—NEW McCarthy coal-recovery drills for underground mining, in two models of the various sizes and capacities to be manufactured, featuring compact size and more power.

Stripping

Aero Service Corp. (2700)—Topographic mapping for estimating coal acreage, delineating crop lines, plotting bore holes, laying out access roads, planning rail spurs, computing overburden and other engineering uses.

Allegheny Ludlum Steel Corp. (214)—Drill bits and complete line of cemented-carbide tools for mining.

American Manganese Steel Div. (1200)—Amsco manganese-steel shovel dipper.

American Cyanamid Co., Explosives Dept. (1224)—Explosives, detonators and other blasting supplies.

Atlas Powder Co. (1400)—Overburden blasting techniques.

NEW—"Shotmaster" condenser-discharge blasting machine with hand-wound generator.

Austin Powder Co. (916)—Stripping augers and bits.

Baldwin-Lima-Hamilton Corp. (136)—Stripping shovels.

Bucyrus-Erie Co. (1623)—Working model of 150-B 6-cu yd shovel.

Carboloy Dept., General Electric Co. (1530)—Rock-drilling bits and carbide mining tools.

Cardox Corp. (2000)—NEW tractor-mounted vertical drill; other portable drilling equipment.

Caterpillar Tractor Co. (1500)—Caterpillar scrapers and other excavating equipment.

Davey Compressor Co. (450)—NEW Model 8A heavy-duty rotary drill designed for mounting on any standard truck and using both air and high-pressure water for drilling. Rated capacity is 6¾-in holes up to 300 ft with air and 1,000 ft with mud. Drill is fitted with 30-ft mast and designed for pulling 15-ft drill sections.

Electric Steel Foundry Co. (1539)—Completely rigged 4½-cu yd tapered dragline bucket; "ESCO" swivel dump block; patented "ESCO" wedge-type dipper door; other specialties, including points, adapters and bucket rigging.

Euclid Div., General Motors Corp. (1629)—Model S-7 overhung 7-cu yd struck-capacity scraper.

George E. Failing Co. (440)—Failing Model CBH "Holemaster" drill rig with hydraulic chain feed and compressed air for removing cuttings. Designed for truck mounting, drill capacity is 400 ft using 2⅞-in drill pipe. Hole sizes vary from 4¼ to 6¼ in, depending on formation and depth.

Firth Sterling, Inc. (717)—Drill bits, finger bits and inserts.

International Harvester Co. (1547)—NEW International 75 "Payscraper"—largest high-speed rubber-tired earth mover in International line. Features include 263-hp diesel engine, 18 cu yd heaped capacity, speed of over 24 mph, hydraulic steering, air-assisted clutch, greater operator comfort.

Harnischfeger Corp. (119)—P&H "Magnetorque" hoist drive.

NEW—P&H electronic control for P&H electric shovels, making possible up to 10% higher production.

Herb J. Hawthorne, Inc. (2003)—"Blue Demon" replaceable interchangeable-blade bits for rotary drilling, air or water.

NEW—Replaceable-blade bits; "Blue Demon" rock bits with tungsten-carbide inserts for cutting edges.

Hendrix Mfg. Co.—Latest-model stripping bucket featuring 14% manganese-steel lips, chains and fittings.

Hercules Powder Co. (1425)—Explosives and blasting supplies.

NEW—"King-Size" cartridges in small diameters and four lengths; also condenser-type "Titan" blasting machine.

Kennametal, Inc. (739)—Kennametal tungsten-carbide drilling tools.

NEW—Tungsten-carbide percussion-drilling application.

LeTourneau-Westinghouse Co. (1532)—NEW B "Tournapull" with B scraper, 18 cu yd struck, 2 to 29 mph, 293-hp Cummins or Detroit Diesel engine, ten gear ratios, power steering, and ability to turn in a 35-ft circle. The scraper may be interchanged with a 35-ton rear-dump haulage unit.

Marion Power Shovel Co. (1003)—Stripping shovels, draglines, coal loaders, and other excavating equipment, featuring new 60-cu yd Hanna shovel.

McLaughlin Mfg. Co. (833)—Drilling tools.

Olin Mathieson Chemical Corp., Explosives Div.—Explosives and blasting supplies.

Page Engineering Co.—Page Model 721 walking dragline.

Reich Bros. Mfg. Co. (535)—Heavy truck-mounted rotary drill, built-in hydraulic leveling jacks, capable of 20,000 lb down pressure on bit.

Salem Tool Co. (1107)—Horizontal and vertical drills, drilling heads, mining tools.

Varel Mfg. Co.—Model 540-A "Jet-Rig" rotary air drill for holes up to 7⅞ in; Varel rotary cone-type and blade-type drilling bits and related items.

Vascoloy-Ramet Corp.—Drilling tools.

Auger Mining

Cardox Corp. (2000)—NEW diesel-driven Model 155 "Surface AugerMiner."

Compton, Inc.—Model 28 coal auger and mining heads.

Herb J. Hawthorne, Inc. (2003)—NEW "Blue Demon" bits for augering.

Salem Tool Co. (1107)—McCarthy coal-recovery drills; other augers and mining tools.

Coal Preparation

Allen-Sherman-Hoff Co. (1908)—NEW "Hydroseal" and "Centriseal" materials-handling pumps. For pumping abrasives and/or corrosive fluid-solids mixtures, the Centriseal requires no gland water, is lined with easily replaceable parts of rubber or synthetic substitutes and is available with corrosion-resistant alloys for metal parts around the stuffing box.

Allied Chemical & Dye Corp., Solvay Process Div.—Solvay calcium chloride for freezeproofing and dustproofing coal.

Allis-Chalmers Mfg. Co., General Machinery Div. (1528)—"Ripl-Flo" screen with "Thermo-Deck" heating unit and automatic stop control; "Low-Head" screen; coal-washing and rubber-lined pumps.

American Chemsol Corp.—Standardized float-and-sink solutions, flocculants, reagents for floth flotation.

Ashland Oil & Refining Co. (621)—Coal-treating oils.

Baldwin-Lima-Hamilton Corp., Construction Equipment Div. (136)—Coal-crushing plants.

Barber-Greene Co. (1900)—B-G materials-handling equipment.

NEW—Screening device for handling various extremely wet and fine materials.

Bird Machine Co. (233)—Bird continuous centrifugal coal filter; Bird centrifugal "Polisher" for cleaning up washery water; Bird-Prayon continuous rotary horizontal pan-type vacuum filter; Bird-Young continuous drum-type vacuum filter.

NEW — Bird-Humboldt centrifugal drier for dewatering fine coal after cleaning. Employing a perforated cone-shaped screen and combining centrifugal separating force with vibratory action to effect thorough separation with continuous large-volume output, the unit offers high separating efficiency, high solids recovery, low power consumption and long screen life.

Bixby-Zimmer Engineering Co. (607)—Bixby-Zimmer all-welded stainless-steel screens.

NEW—New-type grizzly rod screen, designed for maximum performance and screen life.

Centrifugal & Mechanical Industries, Inc.—C-M-I centrifuge, various-sized cyclones.

Combustion Engineering, Inc., Raymond Div. (112)—C-E-Raymond flash-drying system for fine coal.

NEW—Dedusting system for use with C-E-Raymond system.

Deister Concentrator Co. (1905)—SuperDuty Diagonal-Deck coal-washing table; Concenco spray nozzles.

NEW—Concenco Model 208 feed distributor featuring low headroom requirements, heavier construction and more positive splashproofing. Model E Leahy vibrating screen with "FlexElex" screen jacket heater featuring dual hooked-end screen panel for easier jacket changes without breaking electrical connections and easier screen-cloth tensioning.

Dorr-Oliver, Inc. (731)—Dorr-Oliver horizontal- and disc-type filters, thickeners, classifiers, cyclones.

Dow Chemical Co. (2307)—NEW—"Separan 2610," a coagulant or flocculating agent for separation and filtering of water-dispersed solids, said to cut material losses by as much as 80%. Use of Separan has increased product recovery up to 5% and greatly reduced waste-disposal problems by improving overhead clarity. Separan also reportedly has a high capacity for increasing the filtering rate, permitting a reduction in normal filter area up to 88%. Small dosages, effectiveness over a wide pH range and easy storage without preservatives are other advantages.

Fairmont Machinery Co. (2423)—NEW Fairmont fully automatic density control for Chance cones and dense-media vessels; 3 x 9-ft cable-suspended Parrish-type screen with self-contained drive head for desanding, dewatering and screening.

Fuel Process Co. (2554)—NEW Belknap coal-washing system, featuring increased effectiveness of the dense-media principle by use of a media-recovery system and automatic specific-gravity control, with reduction of media cost to as low as 1½c per ton of washed coal.

Gulf Oil Co. (909)—Gulf coal-spray oil.

T. J. Gundlach Machine Co. (920)—Gundlach two-stage double adjustable coal crusher.

Hendrick Mfg. Co. (1209)—Perforated metals of all types; Wedge Wire screens and Wedge Slot screens.

Hewitt-Robins, Inc. (700)—NEW "hiG" vibrating screen using an entirely different principle of "modified resonance" which produces a controlled, extremely sharp vibrating action and permits building larger screens requiring only small accessible exciters and using only one-quarter to one-half the normal power needed. Standard sizes available up to 6 x 28 ft, requiring only 15 hp. Also new "RoBINtronic" level indicator, a heavy-duty electronic device capable of use with heavy lumps if necessary. Unit features sturdy probe, with no moving parts, connected to control unit mounted up to 300 ft away to actuate signals, motors, chutes or other operations.

Heyl & Patterson, Inc. (1638)—36-in Reineveld centrifuge; 3-, 8- and 14-in H&P cyclones.

NEW—25- and 8-in Reineveld "Centriplanes" for dewatering slurry and effecting maximum recovery.

Robert Holmes & Bros., Inc. (2301)—Holmes coal-lowering spirals; Holmes Baughman "VertiVane" thermal driers; Holmes laboratory crushers and pulverizers; Holmes car-handling equipment.

Interstate Equipment Div., Yara Engineering Corp. (120)—Aerial tramways, drives, controls and other equipment.

Jeffrey Mfg. Co. (2743)—Jeffrey 30 x 36-in double-roll crusher; Jeffrey-Traylor vibrating pan feeders.

Kanawha Mfg. Co. (124)—Coal preparation plants.

Keenan Oil & Fuel Co.—Keenoil No. 7 coal-spray oil, with method for quality-control testing and freezeproofing procedures.

NEW—Additive for coal-spray oil to dewater coal and reduce moisture pickup, lowering costs of coal spraying because of small quantity of oil required.

Laboratory Equipment Co.—Equipment and methods for determination of sulphur content of coal.

Lecco Machinery & Engineering Co. (1021)—Lecco-Vib Model C1-20 4 x 8-ft

Post-Convention Report

As a reader service, *Coal Age* will present in its June issue a complete staff-written report of the 1955 Coal Show—covering both the convention proceedings and the manufacturers' exhibits.

double-deck inclined-type scalping screen.

NEW—Lecco Model 02-22 5 x 14-ft single-deck horizontal vibrating screen, a new design in a heavy-media rinse screen; and Lecco horizontal vibrating conveyor, 20 in by 12 ft.

Link-Belt Co. (107)—Link-Belt Multi-Louvre drier for drying fine coal.

NEW—Vibrating screen especially designed for handling and dewatering fine coal, featuring space-saving low profile and high capacity.

Ludlow-Saylor Wire Cloth Co. (831)—Wire cloth in a wide range of types, including "Arch Crimp," "Double Crimp," "Intermediate Crimp" and "Sta Smooth" in square openings; "Rek-Tang," "Sta-Clear" and "Sta-Thru" in slotted openings, both in abrasion-resistant metal such as "Super-Loy" and corrosion-resistant stainless steel; hook strips and hooked edges for all types of vibrator screens.

Lukens Steel Co. (335)—"Stainless-Clad" steel coal-handling equipment, including hoppers, chutes, etc.

McLanahan & Stone Corp. (2441)—Coal crushers in various types and sizes.

NEW—Black Diamond double-roll crusher for fine and medium-fine reduction of coal, available in a wide range of sizes and featuring a new, unusual method of adjustment and tramp-iron protection.

McNally Pittsburg Mfg. Corp.—McNally Pittsburg dense-media, drying and coal-preparation equipment and plants.

Morris Machine Works—Slurry and dredge pumps for handling abrasive mixtures.

The Nolan Co.—NEW Hein, Lehmann radial screening plant, a German-designed combination of partitioned and radial screen for preliminary dewatering, to be made and sold in the U. S. by the Nolan Co. Features include marked advantages in initial cost, maintenance, weight and floor-space requirements; accuracy of separation maintained; and elimination of power costs since only moving part is propelled by pulp and no drive is required.

Nordberg Mfg. Co. (624)—Symons V-Screen for dewatering, dedusting and sizing, featuring an unusual combination of gravitational and centrifugal forces for high screening capacity and more accurate sizing in the smaller sizes.

Orefraction, Inc. (2605)—Orefraction magnetite for heavy media systems.

NEW—"Superfine-Grind" magnetite for more economical recovery.

Peterson Filters & Engineering Co. (1901)—Peterson "Flag Line Construction" filters, including the TFR (Top Feed Reservoir) filter and disc filter with "Dual Guide" one-piece stainless-steel scraper to maintain maximum scraper life with woven-wire stainless-steel filter medium.

NEW—Peterson "Roto-Disc" filter-thickener used to supplement gravity thickeners for refuse slime thickening and dewatering in closed circuits. Filter cake discharged as cake slabs said to have greater density, settles rapidly and compresses into a very thick mass, permitting very thick underflows greater than 50% solids even on highly flocculated slurries.

Productive Equipment Corp. (2200)—"Gyroset" vibrating screens.

NEW—Newly developed special construction to provide for cross-slot bar screens.

Roberts & Schaefer Co. (2100)—R&S equipment, design and construction facilities for coal preparation.

Sanford-Day Iron Works, Inc. (1612)—Oil-spray equipment.

NEW—Brown-Fayro barge and railroad-car mover.

Stearns Magnetic, Inc. (141)—NEW electro-magnetic pulley of two-coil design providing a more powerful magnetic field than the conventional three-coil type.

W. S. Tyler Co. (215)—"Ty-Rock" 5 x 12-ft double-deck vibrating screen; "Ro-Tap" testing-sieve shaker; Tyler standard-screen scale testing sieves; and woven-wire screens.

United Engineers & Constructors, Inc. (1212)—Chance coal-cleaning process.

Wedge Wire Corp. (925)—Wedge Wire screens in various constructions.

U. S. Steel Co. (225)—Stainless steel for preparation-plant service.

Western Machinery Co.—Coal-cleaning plant design and construction, coal spiral, HMS drum separators, Fagergren flotation cell and "Torque Flow" solids-handling pumps.

Wilmot Engineering Co. (837)—Wilmot cone cleaners, classifier, cleaners and froth units.

NEW—Wilmot "OCC" vessel for heavy-media separation, described as a comparatively simple mechanism featuring efficient and economical removal of sink material with a minimum of disturbance of the separating pool, available in seven basic designs in feed capacities of 25 to 400 tph.

Face Preparation

Allegheny Ludlum Steel Co. (214)—Cemented-carbide cutting and drilling bits.

American Cyanamid Co. (1224)—Explosives, electric blasting caps and blasting supplies.

Austin Powder Co. (916)—Drill bits and augers; tungsten-carbide cutting-machine bits.

Bowdil Co. (1006)—Coal-cutting chains for all types of mining machines; Bowdil bits and cutter bars.

Carboloy Dept., General Electric Co. (1647)—Carboloy-carbide mining tools, carbide tips for rock bits.

Cardox Corp. (2000)—"Airdox" coal-breaking units, both stationary and semi-portable.

Chicago Pneumatic Tool Co. (1513)—CP integral sinker airleg with a CP-32A wet sinker.

NEW—Lightweight handheld CP hydraulic coal drill.

Cincinnati Mine Machinery Co. (2715)—Cincinnati cutter chains, cutter bars, sprockets and cutter bits.

NEW—Redesigned trimming chain for Goodman and Marietta miners; newly designed chain for rotary-type mining-machine heads; and several new-type cutter chains for high production.

Cleveland Rock Drill Div., Westinghouse Air Brake Co. (2555)—"One-use" bits.

Femco, Inc. (921)—Femco permissible shotfirers.

Firth Sterling, Inc. (717)—Mining-machine bits, drill bits and drill-bit inserts.

Goodman Mfg. Co. (2642)—Goodman Type 2400 rubber-tired cutting machine.

Hercules Powder Co. (1425)—Permissibles and blasting supplies.

Jeffrey Mfg. Co. (2743)—NEW A9A handheld lightweight hydraulic drill, weighing only 25 lb and using piston-type motor.

Joy Mfg. Co. (2525)—Joy equipment for cutting and drilling.

Kennametal, Inc. (739)—Tungsten-carbide bits for cutting and drilling.

McLaughlin Mfg. Co. (833)—Drill bits and tools for handheld, post- and machine-mounted drills.

NEW—No. 4-LC carbide finger bits and No. 16-G holder.

National Mine Service Co. (2609)—"Permi-Seal" tamping plugs.

Newcomer Products, Inc. (617)—Carbide-tipped mining-machine and drill bits.

Explosives Div., Olin Mathieson Chemical Corp.—Armstrong coal breaker, blasting caps and mine explosives.

Frank Prox Co., Inc. (1204)—Cutter chains for all types of machines, sprockets, cutter bars, throwaway bits.

Schroeder Bros. (1609)—Hydraulic coal drill.

Timken Roller Bearing Co. (900)—Timken rock bits.

Vascoloy-Ramet Corp. (6120)—Tungsten-carbide mining tools.

Roof Control

Acme Machinery Co. (725)—Model HSJ "Stoper Jumbolter" for bolting in mines with piped or stationary air.

NEW—Model 275 Acme self-propelled rubber-tired two-stage air-cooled air compressor with built-in dust-collector system and two mounted stoper jumbo arms—a self-contained permissible bolting unit offered with or without cable reel and featuring full power steering, airplane disc-type brakes and hydraulic drive.

Allegheny Ludlum Steel Corp. (214)—Drill bits for roof-bolting.

American Chemsol Co.—Roof-coating chemicals.

Armco Drainage & Metal Products, Inc. (341)—Armco tunnel liners.

Ashland Oil & Refining Co. (621)—Asphaltic fire-resistant mine-roof spray compound.

Austin Powder Co. (916)—Roof-drill augers.

Bethlehem Steel Co. (129)—Bethlehem mine roof bolts and accessories; hollow drill steel.

NEW—Bethlehem yieldable mine arch for roof support under heavy pressures. Easily installed, recoverable and requiring minimum maintenance, the arch yields rather than deforms or buckles under pressure, thus providing greater control and safety by permitting strata to stabilize naturally.

Browning Dust Collector Co.—Dust collectors for percussion and rotary

drilling; pantograph arms for mounting stoper drills.

NEW—Dust collector requiring no setup time.

Carboloy Dept., General Electric Co. (1647)—Carboloy roof-drill bits.

Chicago Pneumatic Tool Co. (1513)—Electric and air-operated roof-bolting equipment, including Model RBD-30 mobile bolting unit, CP-134 short stoper, CP impact wrench, and various-sized stopers for wet or dry operation.

Cleveland Rock Drill Div., Westinghouse Air Brake Co. (2555)—Cleveland stopers, stoper arms and dust-collection system.

NEW—Newly designed stoper especially adapted to bolting in very low coal, including a new highly efficient dust-collector system and special bits offering exceptionally fast cutting and superior free-cutting and dust-collecting qualities.

Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div. & Pacific Coast Div. (628)—Roof bolts and accessories.

Dooley Bros.—NEW Dooley mobile hydraulic-electric roof drill and bolting unit, 30-in height, with arms extendable to 80 in and capable of drilling 50 in on horizontal in one setting. Arm also positions and tightens bolt. Mobile truck has transmission and clutch, with circuit breakers for overload protection.

Duff-Norton Mfg. Co. (1401)—Mine roof support jacks.

Firth Sterling, Inc. (717)—Roof-drill bits.

J. H. Fletcher & Co. (219)—Model DAE 28-in and Model DAB 48-in drill units.

NEW—Fletcher Model DAF roof-control drill, using new floor-to-roof feed system and featuring increased feed, stroke and rigidity; higher drilling speeds and thrust capacity; and more operator protection.

Joy Mfg. Co. (2525)—Joy single- and twin-boom hydraulic roof-bolting drills.

Kennametal, Inc. (739)—Kennametal bits for roof drilling.

McLaughlin Mfg. Co. (833)—Drill tools and forged shanked roof rods.

Mine Safety Appliances Co. (1009)—MSA "Bolt-Hole Cleaner" for maximum dust-collecting efficiency.

Ohio Brass Co. (1613)—O-B expansion shells and plugs.

Osmose Wood Preserving Co. of America, Inc. (618)—Osmose timber preservative methods and products, including "Osmosalts," "Osmoplastic," "MTM" and "Pentox."

Pattin Mfg. Co. (935)—Roof-bolting materials.

NEW—Pattin Style D-2 expansion shell featuring a limit stop said to be very effective in soft roof.

Pittsburgh Screw & Bolt Corp. (620)—Roof bolts and accessories.

Republic Steel Corp. (825)—Republic mine roof bolts and plates.

NEW—Variations of Republic mine roof bolts with added safety and performance features.

Templeton, Kenly & Co. (821)—Simplex roof-support jacks.

Vascoloy-Ramet Corp. (612)—NEW roof-type drill bits and auger bits.

West Virginia Steel & Mfg. Co. (2516)—Full line of roof bolts; "Fingertype" and "Standard" expansion units.

NEW—"Wedgegrip" expansion unit.

Mine Cars, Shuttle Cars, Locomotives, Tractors, Track

ACF Industries, Inc. (1523)—Latest-type ACF all-steel dropbottom mine car; mine-car wheels of most modern type.

American Mine Door Co. (1010)—Electric switch thrower.

NEW—Model 30 track cleaner especially developed for 30-in coal seams but available in other models for mines with higher seams.

Bethlehem Steel Co. (129)—Bethlehem products for faster haulage, including mine cars designed to individual requirements; heavy-duty prefabricated mine trackwork; and forged mine-car wheels.

Differential Steel Co. (306)—Large-capacity, low-height 8-wheel mine car.

Enterprise Wheel & Car Corp. (115)—Aluminum mine car.

General Electric Co.—NEW Type TLE-43 tracklaying shuttle car, a completely redesigned 14-ton unit.

Goodman Mfg. Co. (2642)—Type 570 shuttle car, 48-in basic height.

NEW—Type 870 Goodman shuttle car combining low height of 26 in with speed and sturdy construction for quick-trip transfer of heavy loads. Features include four-wheel power steering, brakes and drive; operator's cab specially designed for ease of control and comfort; and level capacity of 97 cu ft.

Heyl & Patterson, Inc. (1638)—H&P car dumper.

Robert Holmes & Bros., Inc. (2301)—Holmes hoisting equipment, including hoists, sheaves, skips, cages, automatic skip and cage loading and dumping devices.

Irwin Foundry & Mine Car Co. (1115)—Irwin 8-wheel "Streamliner" mine car; 8-wheel "Man-Van" car; Irwin 4-wheel mine-car trucks; and patented safety hook for coupling pins.

Jeffrey Mfg. Co. (2743)—Jeffrey MT-67 shuttle car.

Joy Mfg. Co. (2525)—Joy 8-SC shuttle car for haulage in low coal; and 10-SC shuttle car for heavy-duty 10-ton haulage on 15% grades in medium and high seams.

Koppers Co., Inc., Wood Preserving Div.—Pressure-creosoted mine ties.

Lee-Norse Co. (318)—NEW Lee-Norse "Drive Wheel Friction" for protection of gearing, shafts and universals in wheel units on 5-SC, 6-SC and 8-SC shuttle cars. New "Mine Portal Bus," latest in the line of vehicles for transportation of mine personnel.

Myers-Whaley Co., Inc. (1407)—Whaley crawler-mounted transfer car.

National Malleable & Steel Castings Co. (1634)—Willison automatic coupler; National NC-1 truck; National "Multi-Pad" rubber-cushioning devices.

NEW—Type F interlocking coupler and attachments for large-capacity strip-mine cars.

The Nolan Co.—Nolan gear-driven rotary dumps.

Ohio Brass Co. (1613)—O-B automatic couplers.

Sanford-Day Iron Works, Inc. (1612)—S-D automatic car-dumping systems; automatic dropbottom mine cars; outside frame construction Granby-type car; hoists and track accessories.

Schroeder Bros. (1609)—Automatic hydraulic car-spotting and car-loading equipment.

W. R. Stamler Co. (1609)—NEW Stamler "Shortie" hydraulic car spotter; and new Stamler hydraulic automatic loading station controls.

U. S. Steel Corp. (225)—NEW mine car, made of "Cor-Ten" steel; mine-car truck of newest USS design.

Watt Car & Wheel Co.—Watt mine-car designs.

West Virginia Steel & Mfg. Co. (2516)—Trackwork and accessories.

Mine Conveyors and Belting

Barber-Greene Co. (1900)—B-G belt conveyors, carriers, return rollers and accessories.

Boston Woven Hose & Rubber Co. (2604)—BWH conveyor belting.

NEW—BWH "High Load" and "Haul King" high-tension belting designed for conveyor and elevator installations on long centers and high unit stresses.

E. I. du Pont de Nemours & Co., Inc. (207)—du Pont conveyor belting.

Flexible Steel Lacing Co. (814)—Flexible belt fasteners, "Flexco" hinged fasteners and scraper plates.

NEW—Flexco speed tools reducing fastener application time up to 50%; and new "Rema" self-vulcanizing rubber repair materials for conveyor belting, requiring no heat or heavy equipment and permitting immediate use of belt.

Goodyear Tire & Rubber Co.—Goodyear conveyor belting.

Hamilton Rubber Mfg. Corp. (2504)—"King Koal" conveyor belting.

Hewitt-Robins, Inc. (700)—NEW modified design of H-R "Mine-aveyor," a shuttle-type belt conveyor with articulating intermediate deck sections and an adjustable fixed tripper, developed primarily for economic transportation of coal produced in present continuous mining.

Hewitt Rubber Co. of Pittsburgh (730)—NEW "Minet" belt splice, a high-strength hinge splice quickly installed with hammer and nippers and requiring no measuring, templates, etc.

Irwin Foundry & Mine Car Co. (1115)—NEW feeder conveyor designed to receive coal from shuttle cars and feed evenly onto belt conveyor or chain pan line; Irwin conveyor chain.

Joy Mfg. Co. (2525)—Standard and heavy-duty sealed-ball-bearing and roller-bearing conveyor idlers and knock-down conveyor sections.

NEW—Joy extensible belt conveyor, including flexible bridge conveyor, for continuous high-capacity haulage up to 1,000 ft, with moves from room to room in less than 2 hr; also, new suspension-

type 2-roller "Limberoller" belt-conveyor idlers that shapes self to load, cushions belt and helps keep belt aligned.

Knapp Mills, Inc.—"Guidler" hyperbolic belt-guiding device.

Link-Belt Co. (107)—Link-Belt conveyor components and accessories.

Long Co. (600)—PT-15 "Piggyback" conveyor and Long room conveyor.

NEW—Long "lift-out" conveyor pan and "Superflite" chain; plus new Long developments for mobile handling and moving of conveyor equipment.

National Mine Service Co. (2609)—Hayden belt-fastening equipment with the new pre-sealed splicing.

Quaker Rubber Corp., Div. of H. K. Porter Co., Inc.—Conveyor belting.

Jeffrey Mfg. Co. (2743)—"Moleveyor" for continuous-mining haulage.

Raybestos-Manhattan, Inc., Manhattan Rubber Div. (2706)—Conveyor belts, including "Homocord," "Homoflex" and "Ray-Man" belts.

NEW—"Wed-Lok" splice and a new type of belting.

U. S. Rubber Co. (1215)—"Super Ustex" nylon conveyor belt.

Whitney Chain Co.—Conveyor chains.

Pumping and Drainage

Armco Drainage & Metal Products, Inc. (341)—Armco "Hel-Cor" pipe, Armco spiral-welded pipe, corrugated metal pipe and asbestos-bonded pipe.

Boston Woven Hose & Rubber Co. (2604)—BWH industrial hose.

E. I. du Pont de Nemours & Co., Inc. (207)—du Pont textile fibers for hose construction.

Flood City Brass & Electric Co. (817)—Mine pumps.

Gorman-Rupp Co. (2705)—Pumps for mine service.

Johns-Manville Sales Corp. (321)—Corrosion-resistant "Transite" pipe.

Raybestos-Manhattan, Inc., Manhattan Rubber Div. (2706)—Hose for mine service.

Republic Steel Corp. (825)—NEW "Kralastic" plastic pipe with new strength and corrosion-resistant features, both flexible and semirigid.

U. S. Steel Corp., National Tube Div. (225)—Plastic pipe.

Voctaulic Co. of America (1408)—Victaulic standard "Snap-Joint" lightweight couplings; "Roust-A-Bout" couplings for plain-end pipe; couplings for cast-iron pipe; Victaulic full-flow elbows, tees, reducers, etc.; plastic inserts for flexible plastic pipe; "Vic-Groover" portable pipe tools.

NEW—Size 6-in Victaulic Snap-Joint coupling.

Ventilation

American Brattice Cloth Corp. (1000)—ABC brattice eloth in seven grades; ABC inflatable brattice.

NEW—ABC "Neolon" ventilation tubing, a lightweight nylon-base tubing.

E. I. du Pont de Nemours & Co., Inc. (207)—du Pont "Ventube."

Jeffrey Mfg. Co. (2743)—Midget "Aerodyne" blower.

NEW—6F Series Aerodyne fan, a low-cost six-blade fan for pressures up to 4 in wg.

Joy Mfg. Co. (2525)—5-ft high-pressure mine fan; portable blower.

Tractors and Tractor Shovels

Allis-Chalmers Mfg. Co., Tractor Div. (1528)—HD-15 tractor with dozer or shovel, AD-40 motor grader, HD-5G tractor with hydraulic dozer, WD-45 with back hoe.

NEW—HD-21, "the biggest and most powerful crawler tractor ever put into production." Features include weight of 44,000 lb, 204 hp at the flywheel, torque-converter drive, new high-capacity cooling system, new master clutch, new transmission, new "Tru-Dimension" track, new "Wrap-Around" radiator guard, and Allis-Chalmers diesel engine.

Caterpillar Tractor Co. (1500)—D8 and other tractors and auxiliaries.

Clark Equipment Co., Construction Machinery Div. (1540)—Michigan all-wheel drive, rear-wheel steer tractor shovels, as follows: 75A, 1 cu yd; 125A, 1⅝ cu yd; 175A, 2¼ cu yd; also Michigan T-24 excavator-crane.

NEW—Model 12B tractor shovel.

Electric Steel Foundry Co. (1539)—'ESCO" Buck Forte dozer-rooter; cutting edges and end bits.

International Harvester Co. (1547)—International-Drott TD-14A "Skid-Shovel" with pry-action breakout force, ground-level bucket rollback and Drott "Hydro-Spring" to reduce shock, mounted on new 141 series TD-14A tractor with stronger track assembly.

NEW—TD-24 torque-converter diesel crawler tractor, 200-hp engine with "Decelerator" control of engine speed, planet power steering, and hydraulic torque converter multiplying torque five times.

LeTourneau-Westinghouse Co. (1532)—C "Tournatractor."

Trucks, Engines Generators

Allis-Chalmers Mfg. Co. (1528)—TW-360 motor wagon.

Buda Div., Allis-Chalmers Mfg. Co. (1512)—Buda 8DC-2505 diesel power-shovel engine; 6DAT-779 turbocharged diesel truck engine; 8DAS-1125 "Torcon" torque-converter power unit; BDA-8A "J" 7½-kw diesel generator set, 120/240 v.

Caterpillar Tractor Co. (1500)—Cat DW20 tractor with Athey PH20 coal hauler; D397 315-kw electric set.

Continental Motors Corp.—"Continental" HD-260 engine.

Cummins Engine Co., Inc. (1601)—NEW 335-hp Model NRT-6 and 600-hp Model VT-6 "Turbodiesel" engines, featuring turbocharging to increase horsepower and cut fuel consumption, and new Cummins PT fuel system simplifying service and maintenance.

Dart Truck Co.—Model 50SBDT bottom-dump coal hauler, 50 to 60 tons.

Detroit Diesel Engine Div., General Motors Corp. (1618)—6-110, 6-71 and 4-71 two-cycle diesels commonly used in LeTourneau-Westinghouse, Euclid and Koehring off-highway haulage equipment.

Euclid Div., General Motors Corp. (1629)—22-ton Model TD rear dump, 300-hp engine, Torqmatic drive; Model UD 10-ton rear dump, 138 hp.

Hercules Motors Corp.—Twenty engines and power units from 3 to 500 hp.

International Harvester Co. (1547)—Model RF-230 off-highway truck, 60,000 lb GVW, 201-hp engine, 175-in wheel base.

Koehring Co. (2304)—Improved Koehring "Dumptor" hauling unit, 6 cu yd, gravity dump.

Page Engineering Co.—V-6 horizontal diesel for Page draglines.

LeTourneau-Westinghouse Co. (1532)—C Tournapull rear-dump haulage unit.

Motors and Controls, Conversion Units, Batteries

Allis-Chalmers Mfg. Co., General Machinery Div. (1528)—General-purpose motors.

Exide Iudustrial Div., Electric Storage Battery Co. (240)—"Exide-Ironclad" batteries for mining service, featuring "Silvium," an exclusive new grid alloy.

Ensign Electric & Mfg. Co. (2758)—Ensign-Clark mine-type magnetic starters, with standard and explosion-tested enclosures; centrifugal switches for belt control; "Ensigneer" belt conveyor safety control; Ensign mine power distribution boxes, featuring new mechanical breaker-tripping unit displacing conventional shunt trip.

Femco, Inc. (912)—NEW Bit-Step and Bit-Carrier remote control and indicating systems for pumps, fans, rectifiers, bearing temperatures, pressures, etc,; two-way systems using existing wires in some cases.

Flood City Brass & Electric Co. (817)—Controllers and electrical switches.

General Electric Co.—DC rectifier for mine use; G-E motors in various types; control center and control desk; general-purpose controls.

NEW—G-E Type MDY motor.

Gould-National Batteries, Inc. (2526)—Gould batteries for mine service, and the Gould "Plus-Performance Plan" for battery selection and maintenance.

I-T-E Circuit Breaker Co. (2503)—Type KSC automatic reclosing circuit breaker; Type KB "Urelite" air breaker, electrically operated; molded-case air circuit breakers.

National Mine Service Co. (2609)—NEW sintered-plate nickel-cadmium Sonotone storage batteries featuring high discharge rate, quick charging, less maintenance and long life in mine service.

Ohio Brass Co. (1613)—O-B motor starters, electrical safety and control equipment.

NEW—O-B circuit interrupter for short-circuit protection of mine cables, machines and personnel, differentiating

between simple overloads and actual ground faults; new O-B 1,500-amp quick-break section-insulator switch.

Post-Glover Electric Co. (116)—Mine resistors; automatic transfer switches for mine locomotives.

Reliance Electric & Engineering Co. (2102)—NEW line of "Super T" DC motors featuring "Dynamic Response" formerly obtained only in specially designed units; and NEW Reliance "Totally-Protected" AC motors combining sturdy construction, total protection and precision performance for long life on the job.

Westinghouse Electric Corp. (1501)—USBM-approved explosionproof motors; explosionproof and standard controls; 300-kw portable ignitron rectifier; 300-kva nitrogen-filled hermetically sealed transformer; mine sectionalizing switch.

Electrical Wires, Cables, Bonds and Specialities

Anaconda Wire & Cable Co. (1002)—Anaconda wire and cable for mine service.

NEW—Shuttle-car cable.

Burndy Engineering Co., Inc. (934)—"Mighty Midget" electrical connectors for mine service.

NEW—Burndy method for emergency splicing of flexible mine cable at face or permanent splicing in shop.

Ensign Electric & Mfg. Co. (2758)—Ensign low-resistance rail bonds; Ensign cable splicers.

NEW—Ensign Bulletin 2102 explosion-tested cable reel for portable mine equipment, continuous 100-amp capacity, driven by hydraulic or electric motor.

Flood City Brass & Electric Co. (817)—Trolley-line materials, headlights.

General Electric Co.—Wire and cable for mine service.

Hazard Insulated Wire Works, Div. of The Okonite Co. (1114)—"Hazacord" mold-cured portable power cables for mine service.

NEW—"Hazacord Red Saddle" twin shuttle-car power cable offering greatly increased service life.

Joy Mfg. Co. (2525)—NEW Joy "Quik-Loc" cable connectors that connect positively and safely in seconds and disconnect as quickly.

National Mine Service Co. (2609)—"Safe-Cable" splicing and rebuilding of trailing cables.

NEW—"Dri-Pak" moisture absorbent to prevent corrosion within electrical components.

Ohio Brass Co. (1613)—O-B line materials, locomotive current collectors, rail bonds, fused trolley taps and ground clamps.

Ohio Carbon Co.—Brushes for mine motors, generators, etc.

Penn Machine Co. (2815)—"Everlast Super Weld" rail bonds.

John A. Roebling's Sons Corp. (1421)—Electrical wire and cable for mines.

NEW—Improved parallel twin mining-machine cable.

Rome Cable Corp. (1205)—Rome 60 neoprene-sheathed portable cords and cables.

NEW—Polyethylene-insulated and sheathed mine power cable for high-voltage distribution.

Simplex Wire & Cable Co. (1411)—"Tirex" cords and trailing cables; "Anhydrex" borehole, shaft and feeder cables.

U. S. Rubber Co. (1215)—U. S. "Royal Gold" mining-machine cable.

NEW—"Royal Master" portable cord.

U. S. Steel Corp., American Steel & Wire Div. (225)—"Amerclad" cord and cable.

Power Transmission

Aeroquip Corp. (2510)—Aeroquip flexible hose, detachable re-usable fittings and self-sealing couplings.

NEW—"Socketless" line of hose and fittings.

Allis-Chalmers Mfg. Co., General Machinery Div. (1528)—"Texrope" V-belt drive equipment.

Boston Woven Hose & Rubber Co. (2604)—BWH V-belts.

Brake Engineering Co.—"Automatic Variable Arc Compensator" mechanisms featured in brake and clutch friction bands and shoes.

Dodge Mfg. Corp. (906)—Dodge "Taper-Lock" conveyor pulley, V-belt sheaves, sprockets and couplings.

NEW—Dodge "Flexidyne dry-fluid drive" featuring smooth start, overload protection, reduced power requirements and 100% efficiency at full load; new "Air-Grip" clutch providing instant response with fingertip control; new "Torque-Arm" 60-hp speed reducer; and new Dodge "Taper-Lock" timing-belt drive.

Joy Mfg. Co. (2525)—NEW "Surge-pruf" hydraulic couplings requiring no skiving or extra tools; can be retightened on hose without disassembly.

Link-Belt Co. (107)—Precision chains.

Raybestos-Manhattan, Inc., Manhattan Rubber Div. (2706)—NEW "Poly-V" belts eliminating matching of multiple belts, and featuring less space, higher capacities, more speed ratios, and reduced belt and sheave inventory.

Schroeder Bros. (1609)—Hydraulic power units, filters, devices, controls and maintenance and test equipment.

Twin Disc Clutch Co. (1015)—Twin Disc torque converters and fluid couplings for mine service; friction clutch and power take-off units.

S. K. Wellman Co. (342)—Powdered-metal friction material in discs and brake lining for mine equipment.

Whitney Chain Co.—Whitney "Mine Service" chains, including universal-joint chains, shuttle car and continuous-miner chains, special chains and standard pre-packed chains.

Bearings

Bearing Service Co. (309)—Ball and roller bearings and anti-friction appliances.

Link-Belt Co. (107)—Anti-friction bearings.

SKF Industries, Inc.—SKF anti-friction bearings and pillow blocks.

Timken Roller Bearing Co. (900)—Timken roller bearings.

Wire Rope and Steel Products

Armco Drainage & Metal Products, Inc. (341)—Armco "Steelox" prefabricated steel buildings for mines.

Bethlehem Steel Co. (129)—Bethlehem wire rope for deep and surface mining.

Broderick & Bascom Rope Co. (1201)—Wire Rope and "Yellow Strand" braided wire-rope slings.

NEW—Extra-high-strength Yellow Strand "Powersteel" wire rope.

Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div. (628)—Wire rope for mine service.

Jones & Laughlin Steel Corp. (2513)—J&L wire rope, "Jalloy" and "Jalten" alloy steel.

Leschen Wire Rope Div., H. K. Porter Co. (1208)—"Hercules Red Strand" wire rope for mining; wire-rope slings.

Macwhyte Co. (813)—"Monarch Whyte" strand, improved plow steel, "PREformed" and internally lubricated wire rope, slings and fittings.

Republic Steel Corp. (825)—"Enduro" stainless steel for mine service.

John A. Roebling's Sons Co. (1421)—Wire rope for mining.

NEW—"Royal Blue" line of wire ropes, featuring an independent wire-rope core and 15% higher tensile strength than previous grades available.

Union Wire Rope Co. (616)—"Tuffy" dragline, scraper, dozer and sling ropes, and "Tuffy" hoist lines.

U. S. Steel Corp., American Steel & Wire Div., Stainless Steel Div. and USS Supply Div. (225)—"Tiger Brand" wire rope; stainless-steel roofing and siding; T-1 steel.

Lubrication

Ashland Oil & Refining Co. (621)—Coal-mining petroleum products.

Cities Service Oil Co. (724)—Quality lubricants for coal-mining machinery, including "Trojan" grease, "Pacemaker T" oils, "Sentry" oils, "DC Series" oils.

D-A Lubricant Co., Inc. (2300)—D-A heavy-duty oils and lubricants.

NEW—D-A "Extra-Treated" diesel oil.

Gulf Oil Corp. (909)—Gulf mining machine lubricant, cam grease, journal oil.

Knapp Mills, Inc.—Metallic lead lubricant for use with all types of open gears and bearings, exposed and enclosed chains, wire rope and cable.

Lincoln Engineering Co. (2814)—Lincoln centralized lubrication systems, power-operated lubricant drum pumps, grease guns, fittings, hose and accessories.

NEW—Air-operated "Multi-Luber" and "Power-Drive" centralized lubricating systems; "Balanced-Power" materials-dispensing systems.

Pure Oil Co. (325)—Pure Oil industrial oils and greases.

Shell Oil Co. (941)—Shell "Alvania" multipurpose grease; "Rotella" and "Rimula" heavy-duty engine oils for severe lubrication problems; and Shell "Tellus" oils for efficient hydraulic power transmission.

Socony-Vacuum Oil Co., Inc. (721)—Hydraulic oils, lubricants and greases.

Standard Oil Co. (Indiana) (2435)—Lubrication engineering, research and technical services; supply facilities for mining industry.

Standard Oil Co. (Ohio)—NEW "Sohitac" series of open-gear and wire-rope lubricants, featuring outstanding adhesive characteristics, superior wetting and water-resistance abilities, extreme-pressure load and shock carrying abilities, very high dropping points and uniform consistency.

Texas Co. (108)—"Texaco" products for lubrication of coal mining equipment.

Trabon Engineering Corp.—Fully automatic lubrication systems for all types of underground mining equipment, with lubricant pumps hydraulically or air-operated; plus automatic lubrication systems for various types of tipples, conveyors and cleaning equipment.

New and Renewal Parts

Clarkson Mfg. Co. (1519)—Conveyor flights for various loading machines and continuous miners.

Cooke-Wilson Electric Supply Co. (835)—Replacement parts for mining machines; gears and worms.

Flood City Brass & Electric Co. (817)—Replacement parts for mining machines and locomotives.

Goodman Mfg. Co. (2642)—Goodman replacement parts.

Jeffrey Mfg. Co. (2743)—Jeffrey replacement parts.

Joy Mfg. Co. (2525)—"Genuine" Joy replacement parts.

Kensington Steel Co. (2542)—Castings of improved design and metals for repair and replacement of machine and equipment parts subject to wear and strain.

Link-Belt Co. (107)—Link-Belt chain for mining applications.

Mining Machine Parts, Inc. (1221)—MMP replacement parts for mining machinery, mercury relay tubes, contactor relay operating coils, and blowout coils.

National Electric Coil Co. (2538)—Replacement coils for motors and generators.

NEW—"Mylar" film and combinations, "Teflon," "Mica Matt," and advanced catalytic setting resins, new coil-insulation materials for upgrading motor performance.

National Mine Service Co. (2609)—"Genuine" Joy replacement parts.

Penn Machine Co. (2815)—Replacement parts for coal-cutting, loading and haulage equipment.

NEW—Newly designed worms and worm wheels for shuttle cars to make each wheel interchangeable with others.

Tool Steel Gear & Pinion Co. (200)—Hardened gears, pinions, sprockets, sheave wheels, shafts, etc., for mining.

Maintenance

American Chemsol Co.—Rust-preventative compound.

American Manganese Steel Div. (1200)—Automatic welders, hardfacing rods and electrodes.

NEW—Semiautomatic MF (magnetic flux) welder.

Baldwin-Lima-Hamilton Corp., Construction Equipment Corp. (136)—Hydraulic cranes.

Blackhawk Mfg. Co. (613)—Hydraulic hand and service jacks; hydraulic "Porto-Power" equipment for maintenance; hand tools.

NEW—40,000-psi high-pressure testing pump.

Boston Woven Hose & Rubber Co. (2604)—BWH packings and tape.

Buda Div., Allis-Chalmers Mfg. Co. (1512)—Lifting jacks.

Duff-Norton Mfg. Co. (1401)—Complete line of ratchet, screw and hydraulic jacks; 5- and 10-ton lowering jacks for rerailing and repairing locomotives and mine cars; Coffing ratchet-lever, spur-gear and electric hoists.

Johns-Manville Sales Corp. (321)—Packings and gaskets; asbestos friction materials.

National Mine Service Co. (2609)—NMS's Joy rebuilding service, featuring rebuilt shuttle car converted from non-permissible to permissible type.

Martindale Electric Co. (921)—Electric motor and generator maintenance, including undercutters, commutator grinding tools and materials; ammeter tong test meters and insulation ohmmeter-voltmeter circuit testers.

NEW—Martindale shop-type undercutter for large armatures.

Olin Mathieson Chemical Co., Explosives Div.—Ramset powder-actuated tools.

Osmose Wood Preserving Co. of America, Inc. (618)—Protective coatings.

Pittsburgh Screw & Bolt Corp. (620)—Fasteners for general mine use.

Post Glover Electric Co. (116)—Reel contactor and welders; natural and forced convection electric heaters.

Rust-Oleum Corp. (939)—Rust-preventive coatings.

Snap-On Tools Corp.—Electric impact wrenches; impact guns and nut runners; special diesel-engine tools; standard specialized maintenance tools.

Templeton, Kenly & Co. (821)—Complete line of "Simplex" mechanical and hydraulic jacks and pullers, 5- to 600-ton capacities; specialized jacks and pullers.

NEW—"Simplex Re-Mo-Trol" remotely controlled portable hydraulic puller for both pulling and pushing, in capacities from 10 to 100 tons, particularly effective where space prevents use of self-contained units; and "Simplex Rol-Toe," a hydraulic jack of new design available in 10-, 25- and 50-ton models.

Safety and Communication

American Mine Door Co. (1010)—"Little Chief" and "Mighty Midget" rock-dusters.

Ensign Electric & Mfg. Co. (2758)—Ensign trolley-guard supports.

Femco, Inc. (912)—"Trolleyphones," loudspeaking telephones, "Cagephones," and "Audiophones."

Johns-Manville Sales Corp. (321)—Fire-resistant asbestos building materials for tipples and fire barriers.

Mine Safety Appliances Co. (1009)—Edison "R-4" cap lamps and self-service charging racks; MSA "Bantam" rock-dust distributors; MSA "MinePhone" for mine communication; and a complete line of first-aid materials, self-rescuers, methane detectors, oxygen-breathing apparatus and head protectors.

National Mine Service Co. (2609)—Wheat automatic cap-lamp charging systems; Riken gas indicators, Bullard safety miners' caps; National Model Koehler flame safety lamps.

NEW—Wheat metal charging rack for cap lamps.

Ohio Bell Telephone Co.—Communication instruments and systems.

Raybestos-Manhattan, Inc., Manhattan Rubber Div. (2706)—Safety trolley-wire guard.

Mining Specialties, Services

Aero Service Corp. (2700)—Air photos and topographic mapping for geologic study and timber typing, planning surface facilities, etc.

American Mine Supply Co.—American spad gun, spads and spad hangers.

NEW—Fluorescent circular mining lights.

Ashland Oil & Refining Co. (621)—Asphaltic mine-shaft seal.

Coal Age (1220)—Publishing services for the coal industry.

Coal Mine Equipment Sales Co. (2610)—Rebuilt mine equipment.

Kern Instruments, Inc.—Kern (Swiss) surveying and engineering instruments.

NEW—Kern "Planetable Alidade" with self-reducing, erecting telescope and new-type parallel plotter; special optical "Plummet" for plumbing of vertical shafts or structural members; and new metal-leg centering tripod.

Mechanization, Inc.—Publishing services for the coal industry.

Mining Congress Journal—Publishing services for the coal industry.

Mitchell Industrial Tire Co. (2713)—NEW solid-type "Mitco Mine Tire" especially constructed for mine use, eliminating punctures, cuts and blowouts and resulting lost time from tire failures.

H. H. Robertson Co. (100)—"Galbestos"-protected metal roofs and sidewalls; power and gravity ventilators; insulated wall construction.

NEW—"M-Panel" insulated wall construction.

West Virginia Steel & Mfg. Co. (2516)—Fence posts and concrete reinforcing bars for mine-property use.

Wild Heerbrugg Instruments, Inc. (128)—Full line of Swiss-made optical surveying equipment.

The following also will be represented at the Exposition, but details of products to be displayed were not available at the time this summary was prepared:

Aerial Surveys, Inc.

American Chain & Cable Co., Inc., Wire Rope Div.

Fulton Bag & Cotton Mills.

United States Bureau of Mines.

Warren Refining & Chemical Co.

Weatherhead Co.

KNOWING WHY EXPLOSIONS AND OTHER ACCIDENTS OCCUR is first step in their prevention. J. B. Yanity, USBM safety instructor, is lecturing on methane and its explosives limits. Safety-conscious miners then prove . . .

How 100% Safety Training Cuts Mine Accidents

SAFETY TRAINING of 7,770 employees at nine U.S. Steel (Frick District) mines, started in June, 1954, and completed in February, 1955, has cut the accident frequency rate from 11.14 in May, 1954, to 4.01 during the first 3 mo of 1955. These are typical of results coming out of the USBM accident-prevention course that has been given to 13,500 men, or 100% of the employees of 30 bituminous mines in western Pennsylvania.

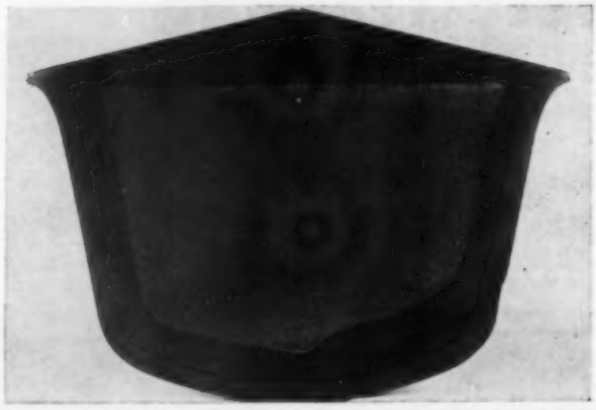
Companies sponsoring the course, during various periods between January, 1954, and March, 1955, also have included the Northwestern Mining & Exchange Co., the Pittsburgh Coal Co., the Allegheny Pittsburgh Coal Co., the Weirton Coal Co., the Emerald Coal Co. and the Duquesne Light Co. Since completion of the course, reports available indicate other drops in accident frequency rates as follows: from 17.0 in November, 1954, to 12.0 in March, 1955, at the Springfield mine, Allegheny Pittsburgh Coal Co., employing 450 men; and from 39.90 in January, 1954, to 17.50 in March, 1955, at the Kramer mine, Northwestern Mining & Exchange Co., employing 475 men.

Two USBM safety instructors, J. B. Yanity and F. A. Cress, gave the accident prevention course to the 30 western Pennsylvania bituminous mines. The only way to 100% participation in accident prevention, Mr. Yanity believes, is through 100% participation in safety training. That this approach brings tangible results also was borne out by his previous experience in 40 mines of Virginia and Kentucky (*Coal Age*, December, 1953, p 67).

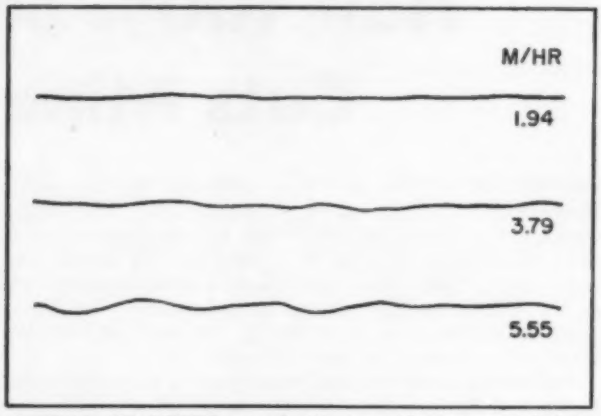
Summing up the results of 100% training, Mr. Yanity says that "production per accident is doubled, better labor relations are created, a good friendly cooperation is stimulated between employees and foremen, and a good spirit of teamwork on the job is maintained." These results are achieved, the USBM instructor adds, because employees and foremen sit together in 2-hr classes for 10 days, covering all phases of mining, and discussing previous accidents as well as safe methods of operation.

STATIC ELECTRICITY is always a potential trouble-maker. Demonstrating the phenomenon is William Eathorne. Watching are: F. A. Durfee (left), superintendent, Robena cleaning plant, U. S. Steel Corp.; Alfred Cavalcante, president, UMWA local; J. A. Boyle, safety director, Robena mine; and J. B. Yanity, USBM instructor.

NEW SOLID-TYPE TIRE installed on shuttle car operating in Princess Elkhorn No. 1 mine. Extensive operating tests on company's 23 shuttle cars have shown the tire gives much better service than high-pressure pneumatics.

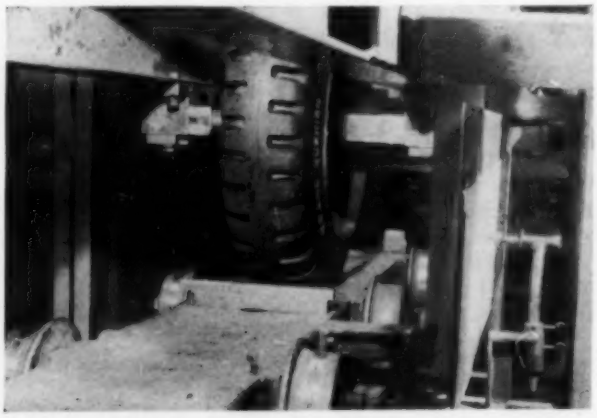


CROSS-SECTION shows why new tire can't go flat. Tough outer stock provides superior cut, chip and wear resistance, with resilient inner stock for cushioning.



EFFECT OF SPEED on shuttle-car ride, as recorded in Princess Elkhorn No. 1 mine. New tires permit up to 25% greater speeds, ride as easily as pneumatics at high speeds.

NEW-TYPE TIRES are smaller, a definite advantage in low coal. New tire (right) carries a load equal to the maximum load of the 10.00-15 pneumatic tire (center).



IN DEVELOPMENT, tires were subjected to controlled laboratory tests as well as field. This apparatus imposes test conditions similar to actual service but more severe.

Solid Tires on Shuttle Cars Cut Operating Costs

Doubled tire life, higher shuttle-car speeds and elimination of down time from tire failures are among operating advantages of new-type tires proved by Princess Elkhorn's experience.

By WALTER CRACE, Chief Electrician, and FRANK MUSIC, General Mine Foreman, Princess Elkhorn Coal Co., and C. W. SMITH and R. L. SEGER, Product Development, U. S. Rubber Co.

MORE THAN 2 MILLION TONS OF COAL has been hauled from the face in low-coal mines in 26- and 32-in shuttle cars of several makes equipped with a newly perfected solid-type "Mine Cushion" tire. Doubled tire service life, increased shuttle-car operating speeds and elimination of tonnage losses as a result of unexpected tire failures are among the benefits experienced in using the tires.

Developed by engineers of the U.S. Rubber Co., the Mine Cushion tires have been undergoing extensive field tests for the past 4 yr at Princess Elkhorn Nos. 1 and 2 mines of the Princess Elkhorn Coal Co., David, Floyd County, Ky., in cooperation with mine management. The company produces approximately 1,000,000 tons a year from the 35-in Elkhorn No. 3 seam and operates 23 shuttle cars at the two mines. At present, a large portion of the tonnage consists of coal 30 in thick.

Losses caused by sudden tire failures on mining equipment always have been a problem to management of mechanized mines. The man-hours, equipment time and coal production lost, together with costs of tire maintenance, are sizable factors affecting operating profits. At Princess Elkhorn, the new Mine Cushion tires have provided a solution to the problem.

TESTING BEGUN IN 1951

The first U.S. Royal Mine Cushions were placed in service in Princess Elkhorn No. 1 mine in May, 1951, on 26-in Joy 8-SC shuttle cars. Their performance proved the soundness of the engineering principles involved and indicated lines of development in design and construction that would further improve service.

For easy replacement, an underground equipment tire must be readily demountable. Making cushion tires of this size demountable was an entirely new concept. It was necessary to develop a special base construction in the tire and also design an adequate adaptor to mount the tire on existing wheels. Development of the tire and the demountable feature was carried to such a point in March, 1953, that an analysis showed tire cost per ton to be less on Mine Cushions than on pneumatics. The analysis showed that cutting tire costs by 50% was a definite possibility.

On a new-type demountable construction tested during 1954, not a single tire failure occurred that could be attributed to design weakness in the base area. Under extra-severe controlled separation test conditions, it has been impossible to expose a weakness in the base of tires of this construction.

FASTER SPEEDS, EASIER RIDING

Cushion-type tires generally are easier rolling than pneumatics of comparable size at the same loads. Since motive power on shuttle cars usually is supplied by series-wound motors on which speed increases as drag decreases, the cars operate at higher speeds on easier-rolling tires. Rolling resistance of Mine Cushions is low and they permit shuttle cars to operate at up to 25% greater speeds than pneumatics, it has been found.

Since cushioning qualities of the early-type Mine Cushion tire was not sufficient to offset the roughness of ride caused by this speed increase, a program for improving the ride was undertaken. Design, construction and compound changes cumulatively improved the tire in this respect. Mine Cushions now ride easier than multiply pneumatic tires at the same car speeds, and as easily as pneumatics at the higher speeds they permit the car to travel.

Greater operating speed gives somewhat higher production, but elimination of lost production because of tire failures is even more important. When a tire fails suddenly, the value of the lost production usually equals the cost of a new tire. At least partial and sometimes total loss of production occurs in a mine section while a tire is being replaced during normal operating time.

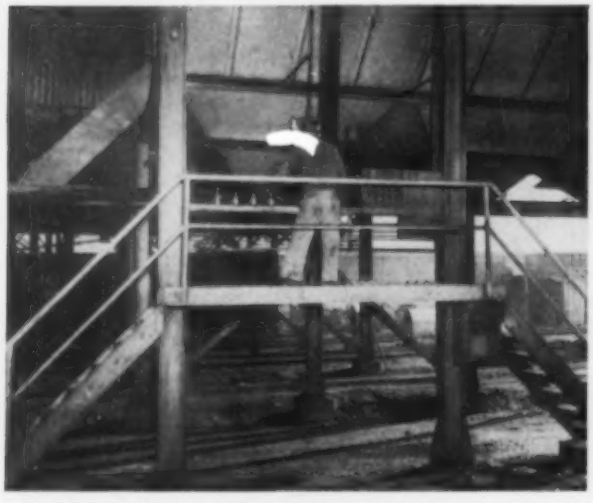
TIRE CHANGES ANTICIPATED

Princess Elkhorn's operating tests have shown that Mine Cushions are not subject to unexpected failures. Since the operator can always anticipate any cause for removal, tires can be changed between shifts or on other non-production time. The actual tire-changing operation is a matter of minutes. To date, Princess Elkhorn has not lost a single ton of production from lost time caused by replacement of Mine Cushion tires.

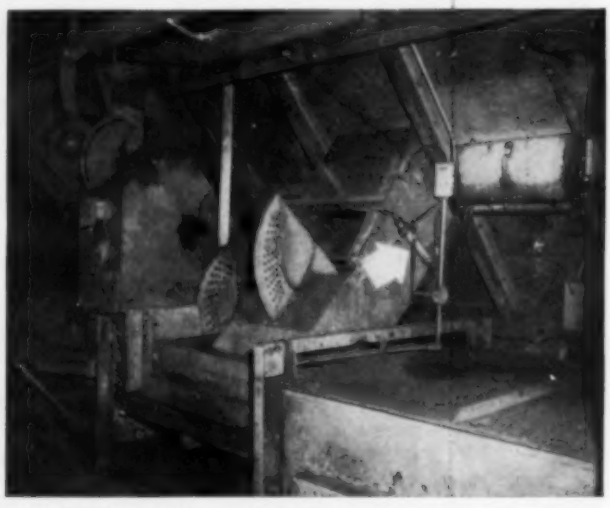
In mining very low coal, the tires aid greatly because they provide adequate carrying capacity on equipment where space for tires is limited. In addition to the benefits of greater safety, U.S. Royal Mine Cushions have been found to decrease equipment maintenance and reduce operator fatigue because of their easier riding. Mine Cushions can be adapted to all underground equipment now on pneumatic tires.

HYDRAULIC POWER for operating various units in plant is supplied by this compact pump and reservoir assembly.

SOLENOID-OPERATED VALVES permitting remote operation of various units are housed in dust-free boxes.



REMOTE CONTROL of transfer of coal from plant storage to retail bins is handled from truck-loading station.



UNDERCUT GATES beneath bins are hydraulically operated to deliver coal to mixing conveyor or domestic belt.

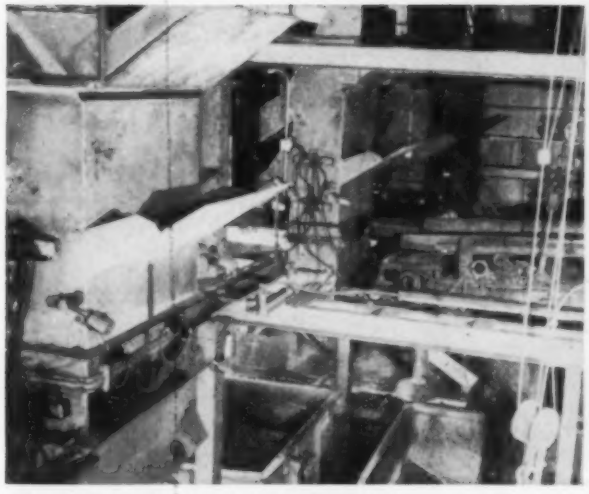
How Hydraulic Power Improves

Hydraulic controls help maintain 1,700-tph raw-coal capacity, reduce human effort and increase safety at Hanna's Georgetown preparation plant.

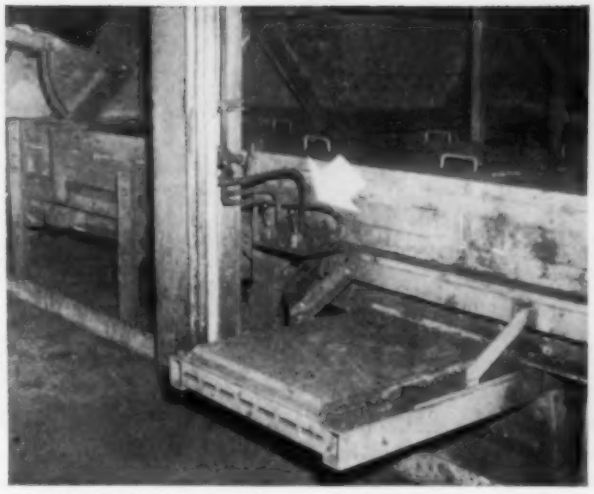
INCREASED PLANT CAPACITY, greater safety for workers and reduction of human effort are top benefits resulting from substitution of hydraulic power for manual effort at the Georgetown preparation plant of the Hanna Coal Co., St. Clairsville, Ohio. From an initial application to improve railroad-car loading, the use of hydraulic power has been incorporated into a central system operating eight separate procedures. The Georgetown plant processes 1,700 tph of raw coal on a three-shift operation and management reports that it would be impossible to handle this quantity of material without the aid of the hydraulic controls.

DEVELOPING THE SYSTEM

To reduce spillage onto railroad tracks, provide continuous loading and at the same time increase the loading rate, Hanna management sought ideas on how power could be applied to operate coal-diverting gates at the bottoms of oil-spray chambers. Hanna's engineering staff was assigned the task of designing power-operated facilities to improve the loading operation. After analyzing the problem, the engineers and plant operators decided that some sort of hydraulic system might be used effectively to operate the gates much faster and therefore improve car loading. Design



FIRST HYDRAULIC APPLICATION was to operate fly gates on oil-treating chambers from operator's station.



PROPORTIONING DEVICE on mixing conveyor is heavy and was hard to adjust before hydraulic power was applied.

FLY GATES on sizing screens are positioned hydraulically without interrupting the coal flow.

GREATER SAFETY plus uninterrupted coal flow resulted from applying hydraulic power to operate this fly gate.

Plant Performance

details were rushed to completion by the engineers and the central machine shop crew was put to work installing the hydraulic system.

The initial setup called for a hydraulic cylinder actuated by a solenoid-controlled valve to be connected to each fly gate. The operating controls were centered in the boom-operator's station. Controls for operating chutes that aid in distributing coal evenly to cars also were included in the first hydraulic system.

Early operating experience with the hydraulic gates was so satisfactory that plans were made to install additional hydraulic units to position fly gates on sizing screens. Results were so good with the second installation that plans were made to expand the hydraulic system to other places.

To date hydraulics have been applied successfully to eight different jobs:

1. Operating fly gates on oil-spray chambers and coal-distributing chutes at loading booms.

2. Positioning fly gates on sizing screens.

3. Regulating the pinch valve under the jig-desilting tank.

4. Controlling undercut gates feeding the domestic-coal belt.

5. Positioning the slide gate (proportioner) on the mixing conveyor.

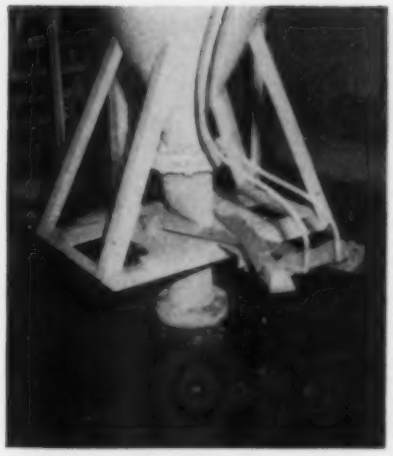
6. Controlling undercut gates on storage bins in the plant.

7. Moving the stoker-coal fly gate that directs coal either to loading booms or to driers.

8. Operating valves that feed make-up sand and water to the sand pump.

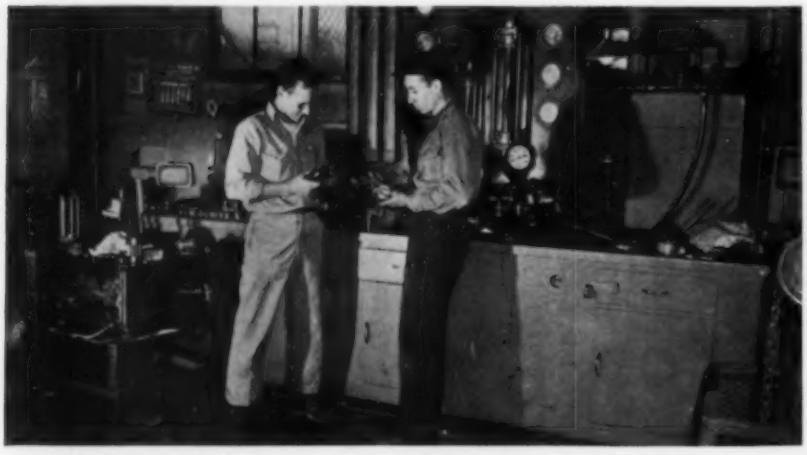
HOW THE SYSTEM WORKS

Essential parts of the system include a 13.2-gpm Vickers pump; three 2½-gal Greer accumulators; 10-hp 1,160-rpm Westinghouse motor; Falk 7F coupling; 28-gpm fluid controls relief valve; Rivett solenoid bypass valve; hand- and solenoid-operated control valves; hydraulic cylinders to move the gates, etc; and a network of ½-in pipe and No. 5 hydraulic hose to carry oil to the various points in the plant.



PINCH VALVE under jig-desilting tank is automatically controlled by a cycle timer to remove settled solids.

EASY and fast addition of sand to the cone washer is now possible by remote operation of feed valves.



ENGINEERS L. S. McNickle and R. Garbesi discuss a pump problem at the Georgetown repair and testing center. Mr. McNickle handles all the technical problems in connection with the hydraulic system.

The network is a closed-center system, that is, all ports are closed when control valves are in the central position. Velocity of hydraulic oil is maintained between 15 and 20 fps and pressure ranges from 850 psi minimum to 1,000 psi maximum. If the hydraulic pressure in the system falls to about 850 psi, the hydraulic pump starts and builds up the pressure to 1,000 psi. Accumulators are installed at each end and middle of the plant to maintain a uniform pressure and assure smooth operation of the system. To prevent a plant shutdown in event of a failure of the motor or pump, a standby unit is maintained in readiness and can be put in service in a matter of minutes.

WHAT THE BENEFITS ARE

The application of hydraulic controls not only has improved railroad-car loading but also made possible safer, more rapid and easier handling of routine jobs. In fact, many of the jobs that required considerable human effort have now become nothing more than pushing a button or moving a hydraulic-valve control lever.

To reposition the fly gates on the discharge ends of screens and direct coal either to loading booms or to the mixing conveyor required considerable time when done by hand. The flow of coal had to be interrupted and this was a complicated process that reduced plant output. Further, a man had to crawl onto the screens to make the change and there always was the possibility of slipping and being injured. Now the gate can be moved almost instantaneously by simply operating a valve located near the shaker.

The proportioning device in the mixing conveyor is a heavy sliding unit and considerable time and effort were required to operate it manually. The job now is handled remotely by pushing a lever that permits oil to flow to the piston that moves the proportioner.

Positioning the fly gate that directs stoker coal either to loading booms or to driers is now handled remotely by push-button control of an electrically operated valve. Coal flow no longer is interrupted and equipment need not be stopped to make the change. To provide the alternate routes for the coal, the fly gate and chutes had to be installed in a relatively limited space between conveyors and the sizing screen. Originally coal flow had to be interrupted and the units stopped before the gate could be safely thrown.

Control of coal flow from storage bins inside the cleaning plant to three domestic bins serving truck customers is handled remotely from a platform at the truck-loading station. One man controls the loading of trucks and refills the bins from his elevated control platform by pushing buttons controlling any one of the undercut gates under the three bins in the cleaning plant. The coal drops onto a belt conveyor and is carried to the domestic bins.

The sand feed to the Chance cone now is handled remotely by push button. Two hydraulic valves located near the sand pump can be controlled separately to feed sand and water to the sand pump and thence to the Chance cone.

Removal of silt from the jig-desilting tank is another job that is handled remotely by automatic timers. A pinch valve installed under the tank squeezes the rubber pipe tightly while silt is accumulating in the settling tank. When settled solids are to be removed the timer actuates a hydraulic valve and the pressure on the pipe is released permitting the silt to flow from the tank.

All solenoid-operated hydraulic valves are installed in dust-free boxes that protect the electric parts from contamination. Valve maintenance has been negligible even though the boxes are located in a dusty atmosphere. Manually controlled valves are installed in the open since dust has no effect on their performance.

Over-all maintenance on the hydraulic system has been very low. Pump packings and "O" rings in hydraulic cylinders have accounted for the majority of maintenance problems to date and these are quickly and cheaply replaced as they show signs of leakage or wear.

Facilities for repairing any part of the hydraulic system are available at Hanna's central shop at Georgetown. Before a unit returns to service, it undergoes a test under conditions similar to those in the cleaning plant.

THREE-WHEELED TRACTOR brings out a loaded car and backs it onto the dump at Cox & Smith mine. The car is a 4-wheeled unit with a capacity of 55 cu ft, normally loaded to 1¾ to 2 tons. Coal thickness is 38 to 40 in.

FOUR-WHEEL DRIVE AND STEER TRACTOR at Cox & Smith heads back in with a trip of 3-wheeled cars (left). Normal capacity of these 3-wheeled cars is 1 ton. Right photo shows 4-wheeled car in dump with 3-wheeler behind.

How Battery Tractors Serve Thin-Coal Truck Mines

BATTERY-POWERED rubber-tired tractors pulling rubber-tired cars are hauling several thousand tons of coal per day at truck mines in the Whitewood area of Buchanan County, Virginia. The coal in this area usually is under 40 in. Several mines work coal under 30 in. and at least one is working coal as low as 24 in. In addition to battery power for haulage, one mine in the area also employs a battery-powered cutting-machine truck.

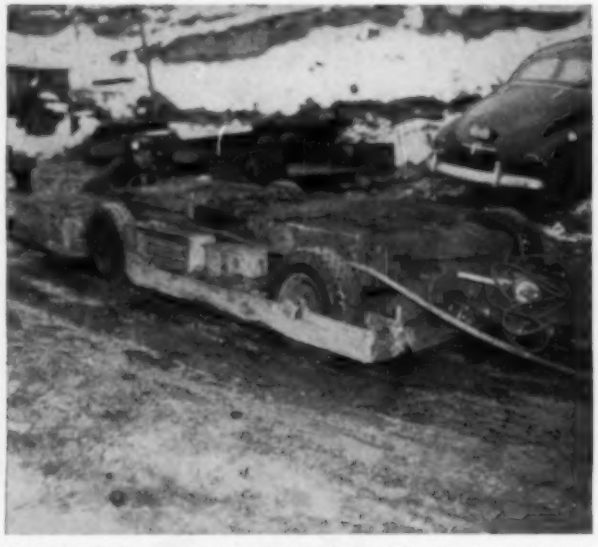
THE TYPICAL TRUCK MINE in the Whitewood area has one short-wall cutting machine, one battery tractor and 2 to 10 rubber-tired cars. The mines truck to four preparation plants shipping on the N.&W. Ry. Twenty-seven truck mines deliver to one plant. All the coal is hand-loaded. One mine undercuts with Jones auger-type machines. And in one, where the working height is only 26 in, the production per man-shift of payroll is 7 tons. The maximum for the area is approximately 9 tons.

The rubber-tired cars are lift-endgate type and are dumped by backing them onto a gravity dump directly in front of the portal. Since hillside drift operations are the rule, the dump is constructed on the edge of a graded berm 40 to 60 ft wide which forms the yard in which the tractor switches the cars to the dump.

THREE-WHEELED TRACTOR pulling trip of loaded 3-wheeled cars at Caudle Belcher mine. Yard is planked.

TRACTOR at Standard Smokeless stops 5-car trip at portal and backs cars one by one to dump over planked yard.

TWO EXTRA BATTERY SETS for the two Standard Smokeless units being charged by 220-v selenium rectifiers.



BATTERY-POWERED TRUCK is used by the H & L Coal Co. to move mining machine and drill between portals.

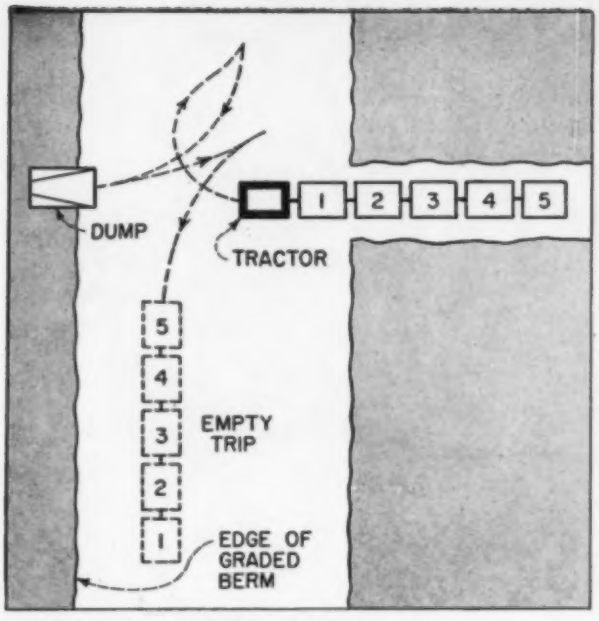
The loaded car at many of the mines is pushed onto the dump by hand, and this is facilitated by a planked approach on a slight down grade. At other mines the tractor backs the loaded car onto the dump and pulls the empty off. Trips brought out of the mines by a tractor may consist of 1 to 10 cars. Five is a typical trip for the average mine.

SWITCHING RUBBER-TIRED CARS

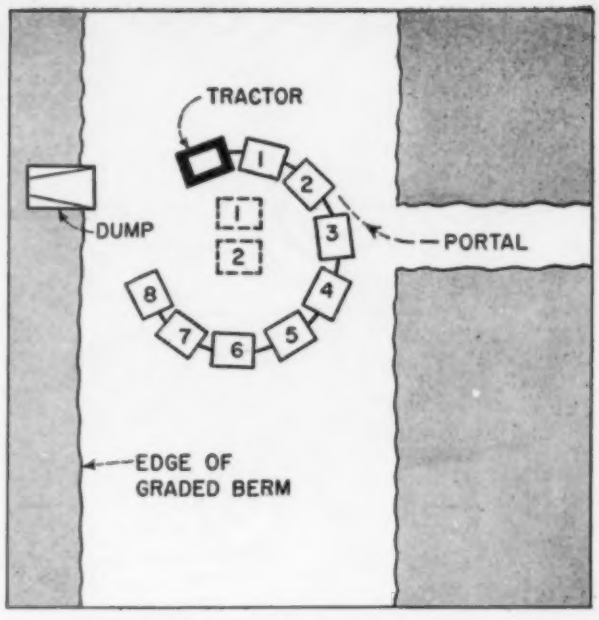
Methods of switching cars on the outside vary widely. Where the tractor handles the cars on and off the dump a common method is to leave the trip standing in the portal, circle with one car, back it onto the dump, pull it off and back it up to the end of a yard or haulage space paralleling the outcrop. Next the tractor hooks to the loaded trip, pulls it one car length farther out of the portal, takes a second car off and repeats the performance until all cars are dumped and the empties are assembled in trains ready to be pulled back into the mine.

Another method is the "merry-go-round," used where cars are pushed on and off the dump by hand. Coming out of the portal with a trip of loads, perhaps 8 cars, the tractor pulls them around in a circle until the last car is opposite the dump. This car is uncoupled and, by hand, is turned 90 deg, backed onto the dump and, after dumping, is pulled by hand into the center of the circle. As soon as the first car is uncoupled the tractor pulls the remainder of the loaded trip around in the same circle and stops again with the last car opposite the dump.

The accompanying photographs, taken at truck mines in the Whitewood area, show how battery tractors and rubber-tired cars are used, and also show a battery-powered truck for a shortwall cutting machine. All this battery-powered equipment was made by the Kersey Mfg. Co., Bluefield, Va., and is equipped with Exide automotive-type batteries. All tractors are supplied with extra batteries of the same make and these are charged with Kersey selenium rectifiers.



SINGLE-CAR DUMPING with battery tractor, 10-car trips.



"MERRY-GO-ROUND" SYSTEM, empties in center.

TRACTORS HAUL 2,000 FT

Two types of Kersey battery tractors and two types of rubber-tired cars are in use at a mine of the Cox & Smith Coal Co., operating in 38- to 40-in coal and trucking 2 mi to a tipple. The first tractor purchased is a Model 336 unit, 3-wheel type with 2-wheel drive, weighing 3,000 lb. The second tractor purchased is a Model 444-C, 4-wheel drive, 4-wheel steer, weighing 4,000 lb.

Original cars were 3-wheeled units carrying approximately 1 ton. The latest are Kersey Model 55B, 4-wheel type, 55 cu ft capacity, normally loaded to 1¾ to 2 tons. The body is 5x10 ft; wheel gage, 68-in; wheel base, 24 in; tire size, 5.50x8. The sides of the car are 13 in high, overall height of the car is 19 in and the ground clearance is 6 in. The bottom of the car is slanted upward at the end to provide a sled runner effect, thus minimizing any tendency to dig into the bottom. Average haul in the mine is now 1,600 ft but the Model 444-C tractor is hauling 2,000 ft. Cutting is done with two Jones auger-type machines operated on 220 v AC.

A six-heading entry is being driven in 24- to 30-in coal at a mine of the Caudle Belcher Coal Co. This entry is now in 2,000 ft from the portal, and a Kersey Model HD-8 3-wheel tractor, 2-wheel drive, 3,600-lb weight, handles the mainline haul. The HD-8 is the latest 3-wheel tractor except for the automotive-type battery. All new Kersey tractors are now being designed to accommodate cells 17½ in high, making it possible to use the long-life Exide-Ironclad traction-type battery.

This HD-8 tractor at Caudle Belcher has the following specifications: length, 10½ ft; width, 72 in; height, 22 in; sighting clearance over the main body, 18 in; ground clearance, 6 in; turning radius, 12 ft; driving tires, 6.50x10; controller, 2-speed oil-immersed drum type; brakes, hydraulic disk, airplane type, with lock; battery, Exide LX4B, 96-v, 12-kwhr, in two trays, demountable.

DUMP YARD PLANKED

Gathering in this Caudle Belcher mine is done with a Kersey Model 336 "All-Steer" tractor. Cars are Kersey 5x9-ft 3-wheel units. Cutting is done with two Goodman shortwalls. The 60-ft yard between portal and dump is planked and there is a slight down grade for 12 ft next to the dump. With its usual trip of three loaded cars, the tractor swings around and backs the last car against a permanent chock on the slope next to the dump. The loaded car is let down onto the dump by hand but the empty is pulled off by the tractor.

Standard Smokeless Coal Co., operating in 26- to 28-in coal, uses two Kersey 4-wheel drive, 4-wheel-steer tractors and 12 Kersey 4-wheel 55-cu ft cars. One tractor is Model 444-C and the other 444-D. Cutting is done with two Goodman 312 shortwalls.

Five-car trips are normally hauled to the outside. Part of the yard and approach to the dump is planked. The tractor leaves the trip at the portal, takes a car, backs it onto the dump, then backs it into a space where the empty trip is made up (see accompanying plan).

Batteries of both tractors are Exide LX4B, 96-v, 136-amp-hr, and an extra set is on hand for each tractor. The charging barn is equipped with a Coffing Challenger ½-ton hoist on a monorail trolley, shelves for two sets of batteries and two Kersey selenium rectifiers.

BATTERY POWERS TRUCK

The H & L Coal Co. commissioned the Kersey Mfg. Co. to design and build a battery-powered mining-machine truck so that one machine can serve two openings with portals 500 ft apart. The mining machine is a Jeffrey 35L unit with 250-v DC motor. The Kersey truck, Type MT-6, 2-wheel drive, 2-wheel steer, is fitted with a 6-unit Exide LX4B automotive-type battery and a Kersey resistance charger so the battery can be charged while the truck is in the working place and the machine is cutting.

Other Kersey equipment at the H & L company includes a 444-C tractor and ten 55-cu ft Kersey 4-wheel cars. Original equipment for the mine, still in use, consists of a locally-made drag-cable tractor and four 1-ton 3-wheel cars.

For fast and convenient dumping it is important that the gravity dump be of a design to properly match the design of the car. Steel dumps made by Kersey are in service at mines of the Cox & Smith, Caudle Belcher and H & L coal companies.

SOME SURFACE PANELS of wedge-wire screen on this 6x14-ft Mitchell Branch vibrator have been in service for nearly 4 yr. Previously, woven screen had lasted 6 mo at Red Jacket plants.

Screen Troubles Eliminated

Wedge wire instead of wire cloth eliminates blinding, increases screen life 500% and cuts replacement costs at four Red Jacket plants.

FREEDOM FROM BLINDING can be seen on a Mitchell Branch wedge-wire screen. The photo was taken immediately after shutdown at the end of a shift.

PRIMARY SCREENING of raw 5x0 and 6x0 coal to remove the ¼x0 for dry cleaning is no longer a problem at the four West Virginia plants of the Red Jacket Coal Corp., Red Jacket, W. Va. Installation of wedge-wire screens to replace the ¼-in stainless cloth formerly used on vibrators has prevented the blinding that occurred when surface moisture of the raw coal rose above 8%, has eliminated loss of stoker coal to the slack, and has increased screen life 500%. Wedge-wire screens have also saved money in material and labor for replacements and have relieved plant operators of the need for frequent inspections to detect blinding and holes in the screen cloth.

The first application was made in June, 1951, on one of a pair of 6x14-ft Allis-Chalmers Ripl-Flo screens handling 5x0 raw coal at Mitchell Branch mine. Originally the screen had a top or scalping deck of perforated ¼-in round-hole plate and a bottom deck of ¼-in stainless-steel wire cloth. This screen was changed to a single-deck unit and was fitted with Kleenslot 3.327-mm aperture

screen made by the Wedge-Wire Corp. Immediate indications of better screening led to the installation of the same type and make of screen surface on the other Mitchell Branch unit in August, 1951. At this writing, some original panels of the Wedge-Wire surface are still in use. Mitchell Branch mines the Coalburg and Lower Cedar Grove seams, washes the 5x¼ in a Baum jig and ships the ¼x0 to the preparation plant at No. 17 mine for predrying and cleaning on air tables.

Junior mine changed three 6x14-ft Ripl-Flo screens from perforated plate and wire-cloth decks to single decks of Wedge-Wire Kleenslot in June, 1952. This mine works both the Upper and Lower Cedar Grove seams, washes 5x¼ in a Baum jig and ships the raw ¼x0 to No. 17.

In April, 1954, one of three 6x14-ft Ripl-Flo screens at No. 17 mine was changed to Wedge-Wire Kleenslot. No. 17 mine, with a new preparation plant completed in 1953, works both Upper and Lower Cedar Grove seams, washes 5x¼ in a Baum jig, predries ¼x0 in a flash drier and cleans it on Super-Airflow tables.

Coal Mountain mine changed the 6x16-ft Ripl-Flo unit to Kleenslot in June, 1952. Here, washing, drying and air cleaning are identical with No. 17 mine, but the coal is from the Dorothy seam and 6x0 goes to the vibrator.

Wedge-Wire screen, tried on a different application at the Keen Mountain (Va.) plant, was unsuccessful. Here, the coal contains less volatile and is softer than the coals prepared at Red Jacket's West Virginia plants. On the Keen Mountain Ripl-Flo screen handling ¾x0, there was not enough coarse material to scour the surface. Blinding was worse than with the ¼-in stainless cloth.

C. P. Ferguson, preparation manager for Red Jacket, says that the company considers itself fortunate to get 6-mo life from stainless cloth. In comparison, he estimates that the average life of all their Wedge-Wire Kleenslot screens will be at least 2½ yr. The comparison is based on the fact that some panels on the Mitchell Branch screens have lasted nearly 4 yr to date.

Stainless cloth, it was found, brought these difficulties. It blinded with damp coal. Also, after a few months, holes developed which permitted passage of much valuable stoker coal to the less valuable carbon grade. When a hole was found during a shift, there was the choice of losing coal or stopping to renew the cloth.

Although the cost of the Wedge-Wire Kleenslot deck is about four times the cost of the ¼-in stainless-steel cloth, the life is at least five times greater. Due to less frequent renewals, wedge-wire deck brings some savings in maintenance labor, although replacing its surface requires twice as many man-hours as that of wire-cloth deck.

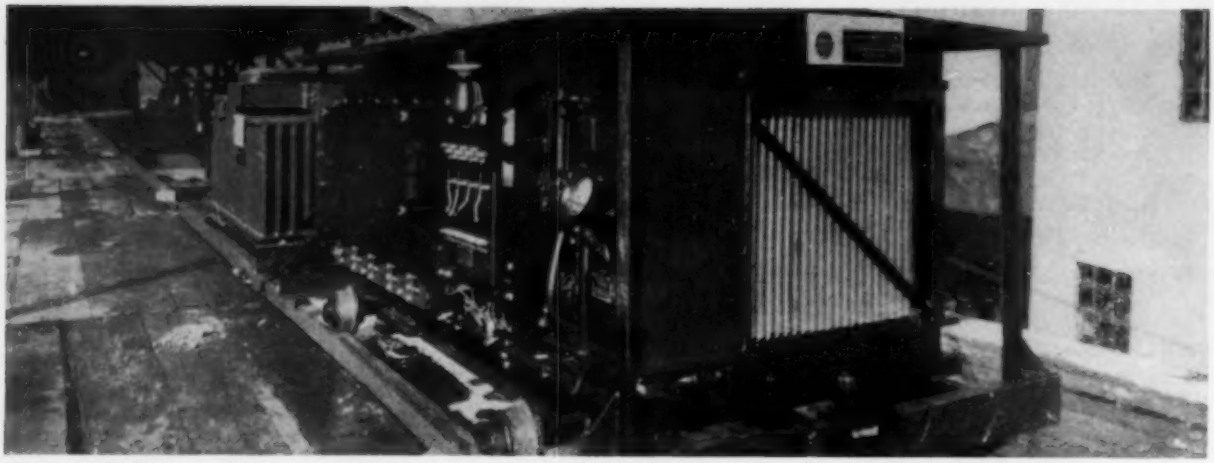
A final advantage results from relieving plant operators of worry over screen performance This gives them a chance to handle the remainder of the plant in a more efficient manner.

Dolly Speeds Heavy Wheel Changes

FAST, easy wheel changes on big 40-ton trucks are possible at Colonial Mining Co., Madisonville, Ky., with the aid of this wheel dolly. A 13x24 tire and wheel can be taken off, wheel bearings repacked and reassembled in 15 min by one man. This formerly required two or three men and consumed considerably more time, says Herbert Scott, night maintenance supervisor, who made the dolly.

The base of the dolly was made from a 27x45-in piece of ½-in steel plate which was cut into the shape shown in the illustration and mounted on three caster-type rollers. Two 30-in pieces of 2x2 angle iron were welded to the base to provide solid posts to which the truck wheels could be secured. A piece of chain welded to one of the posts is placed around the wheel and the free end is placed in slot in the other post. A Midget boomer is used to tighten the chain after it has been placed around the tire.

The dolly also is very useful in speeding tire changes. A driver can report a damaged tire to the shop via radio and a spare can be mounted on the dolly, ready for mounting when the truck pulls into the shop. The change then can be made in a matter of minutes.



The Old . . . FIG. 1—EARLY OPEN-TYPE portable mercury-arc rectifier, 200-kw, built in 1937.

Mercury-Arc

How modern design for safe, automatic operation and reliable performance contribute to mine efficiency.

By W. R. MORTON, Mining Sub-Section
Industrial Engineering Section, General Electric Co.

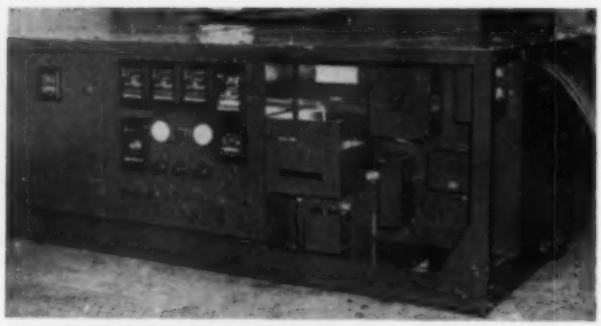


FIG. 3—AC CAR controls incoming power to the rectifier and protects the equipment involved.

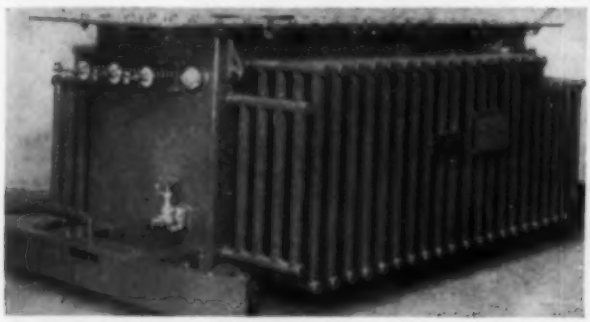


FIG. 4—PRIMARY BUSHINGS on end of transformer car for rectifier unit, shown here front oblique.

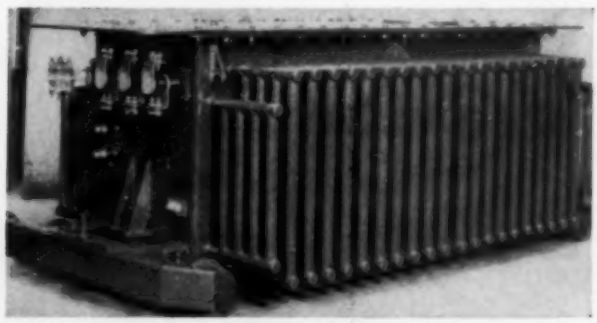


FIG. 5—LOW-VOLTAGE BUSHINGS from rear; nonflammable coolant minimizes fire hazard.

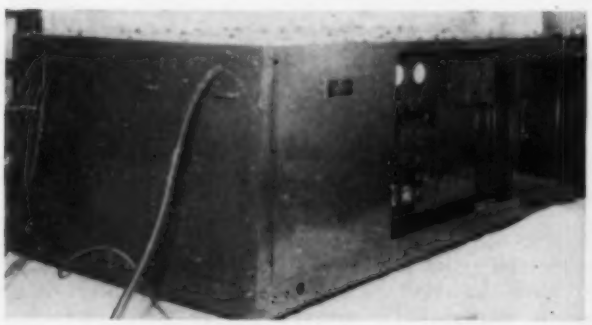
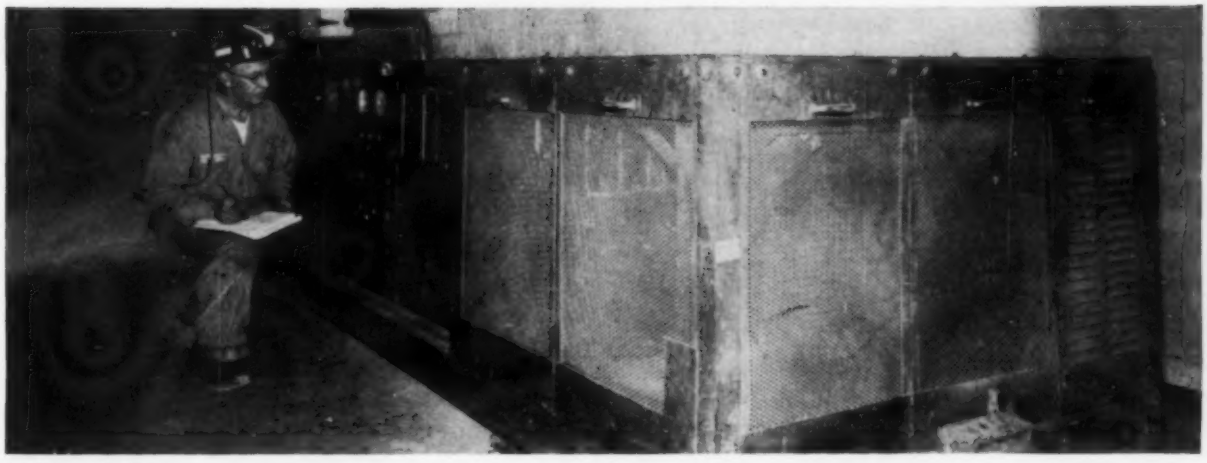


FIG. 6—DC CAR contains rectifier, heat exchanger and control equipment for the DC side.

FIG. 7—DC RECLOSING PANEL with heavy-duty contactor designed for thousands of operations.



The New . . . FIG. 2—MODERN METAL-ENCLOSED portable mercury-arc rectifier, rated at 300 kw.

Rectifiers Today

SEALED-TUBE MERCURY-ARC RECTIFIERS got their start in mining service in the late 30s and consequently are a relatively new type of conversion equipment. One of these early units (portable) is shown in Fig. 1. Their popularity increased rapidly beginning in the time of World War II. This was because portable mercury arc rectifiers provide:

1. More reliable performance with minimum maintenance.
2. High efficiency and optimum voltage at full and light loads.
3. A portable low cost installation located near work site.

A modern portable mining rectifier which incorporates many improvements for automatic operation, safety and lower maintenance is illustrated in Fig. 2. For safety reasons, all live parts are enclosed by grounded metal covers or screens in conformance with modern design for "dead-front" switch gear. Easy inspection and maintenance have been made possible by locating apparatus where it is readily available through convenient doors or removable covers. In cramped underground quarters, it is essential that all major parts of the equipment be readily accessible.

AC ELEMENTS

The front view of the AC car, Fig. 3, shows the use of modern semi-flush instruments and relays with built-in testing devices. The control-circuit fuses are mounted conveniently on the bottom of the control panel and have glow lamps to indicate a blown fuse. Duplex outlets, 0.4 kva at 115 v AC, are provided on the control panels of both the AC and DC cars to provide auxiliary power for small hand tools. The operating mechanism and control devices for the circuit breaker are at the right of the control panel. The current-limiting fuses for the primary of the control power transformer are mounted in the rear of the car behind an easily removable cover plate. Space is also available in the car for mounting either potential transformers or power-factor-correction capacitors.

The portable transformer frame and windings have been designed with extra bracing to withstand the severe duty encountered in mining operations. The unit is self cooled and filled with nonflammable dielectric material to minimize danger from fire and dampness. The high- and low-voltage bushings, Figs. 4 and 5, respectively are brought out at opposite ends of the car. Terminal connectors are furnished for the power cables supplied with the switchgear cars. The transformer tank cover projects over the bushings to help protect them from dripping water or falling objects. This cover also has brackets along the front edge to support the control cable connecting the DC and AC cars.

The primary winding is equipped with four full-capacity taps for no-load tap changing. On dual voltage ratings, such as, 2,400/4,160 v, internal terminal boards are provided. The standard secondary connection is

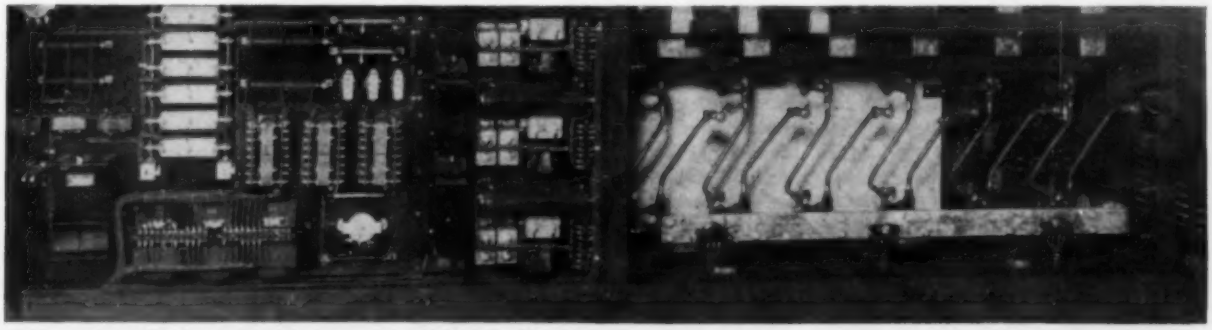


FIG. 3—QUICK INSPECTION of all rectifier equipment is made possible by modern design which also facilitates convenient access to all parts of the unit.

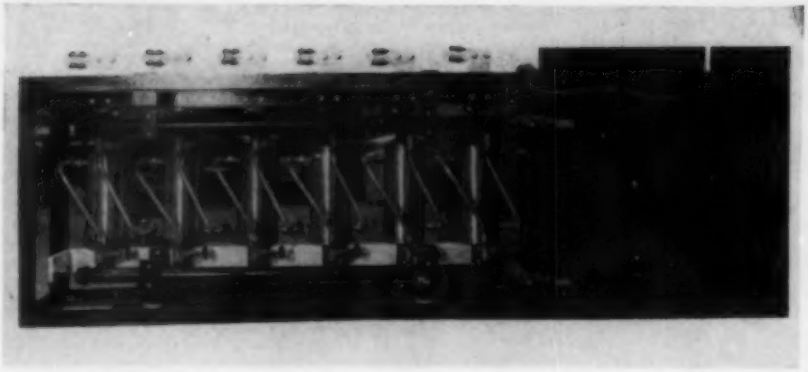


FIG. 9—CONVENIENT TUBE ARRANGEMENT is shown in this view of inboard side of rectifier section of a modern mercury-arc rectifier unit.

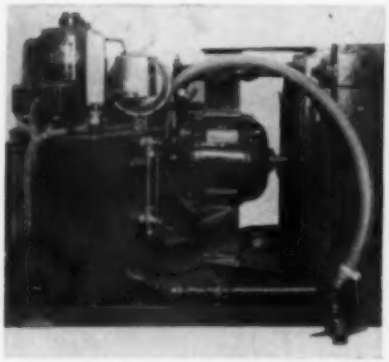


FIG. 10—HEAT-EXCHANGER design features readily accessible controls.

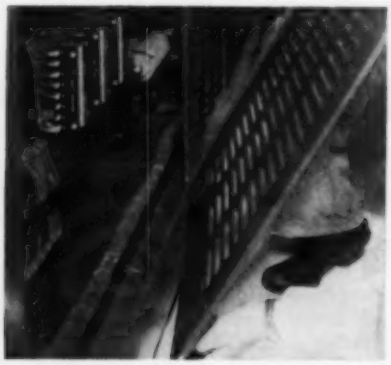


FIG. 11—NEW COVER FASTENINGS make inspection of elements easy.

a double Y with an interphase transformer. On these dual voltage transformers a tertiary winding is provided to damp out the third harmonic when the transformer is operating with a Y-connected primary.

The transformer is designed so that rated DC output voltage may be obtained with an AC system voltage variation of plus or minus 5% of the rated primary tap voltage. The normal unregulated voltage characteristic of the transformer on a typical mine power system would have a 7% droop from no load to full load.

DC FACILITIES

The DC car, Fig. 6, contains the DC switchgear, the rectifier equipment and the heat exchanger. The DC switchgear, Fig. 7, consists of the reclosing relay equipment, line disconnect switch and main-line contactor. A contactor is used to reduce maintenance because it is specifically designed to withstand the many opening and closing operations required in mining service.

Many improvements have been made in the rectifier section. A new firing circuit has been developed which is more compact, quieter and requires less auxiliary power than previous circuits. The new firing circuit, the voltage regulator and the rectifier tubes now can all be mounted along the rear side of the DC car. Thus the complete rectifier equipment, as shown in Fig. 8, can be easily inspected from the rear aisle. To expedite servicing this equipment all these devices have been front wired and front assembled so that access to the rear of the panel is unnecessary.

The essential firing circuit components from the phase shift network to the ignitor leads are mounted on three individual panels with each panel controlling a pair of ignitron tubes. These individual panels are shown at left center, Fig. 8. With this new panel arrangement, it is possible to buy one spare firing panel which may quickly be substituted to help correct firing circuit trouble. The faulty panel can then be repaired at leisure at the maintenance shop.

The amplistat voltage regulator controls the firing circuit and the three amplistats are located to the left center of the firing circuit panels. This regulator is one of the more important contributions to the improvement of mining rectifiers. The amplistat regulator is virtually maintenance free because there are no moving mechanical parts to wear out. Also voltage calibrations are more easily made with only electrical components to adjust.

The amplistat voltage regulator has been coordinated with the design of the main transformer so that for any primary tap setting the incoming AC voltage may vary plus minus 5% but the DC output voltage will be held accurately within plus or minus 1% of the rated output voltage.

COOLING SYSTEM

The water-cooled jacket of each sealed ignitron tube is connected by preformed copper piping to the top inlet water header and to the bottom outlet header (Fig. 9). Shut-off valves are provided at each header connection so that a rectifier tube may be removed without draining the entire cooling system. After the shut-off valves have been closed, the water and antirust compound may be drained from the individual tube by attaching a small hose to the petcock at the inlet fitting and opening an air petcock at the upper outlet fitting.

In the past electrolytic corrosion of the fittings of grounded cooling systems has been a problem. The water jackets of the ignitron tubes are physically part of the cathode and operate at positive DC potential. On modern rectifiers the entire cooling system, including water headers, surge tank, fan and radiator, has been insulated from the DC car framework, and the cooling system "floats" at full positive potential. Since there is no potential difference between the tube jackets and the cooling system, there is no current flow and electrolytic action is eliminated. This is the standard arrangement because most mines operate with a grounded negative system. When rectifiers are furnished for mines operating on a positive grounded system, the insulated cooling system is still furnished. Therefore, it is a very simple procedure to adapt the rectifier if the mine electrical system is ever changed to negative grounding. The elementary diagram shows necessary wiring changes in dotted lines.

The elimination of electrolysis simplifies maintenance problems because normal drinking water, rust inhibitors and all kinds of antifreeze (alcohol or permanent) can be used. Formerly permanent-type antifreeze could not be used on grounded negative units with grounded heat exchangers because the flow of electric current through the coolant would cause the antifreeze to become acid.

The heat exchanger portion of the

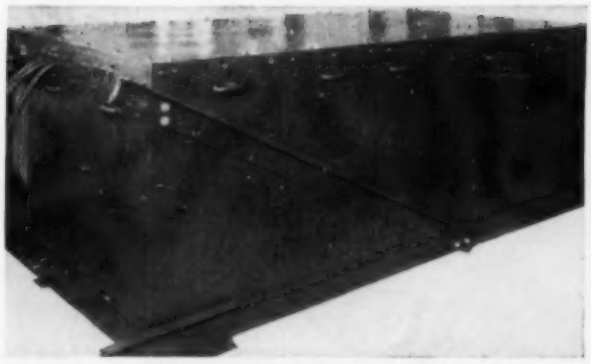


FIG. 12—DIAGONAL BRACING is provided for lowering rectifier cars vertically down small mine shafts.

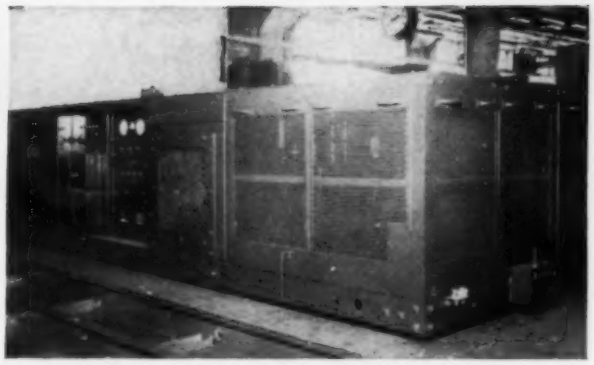


FIG. 13—SEMI-DUSTTIGHT CAR designed for very-dusty mines includes covers and ventilation with filtered air.

cooling system, Fig. 10, consists of a surge tank, vertical water pump, fan and radiator. The water pump is immersed in the coolant and the nuisance of leaking pump seals is thereby eliminated. The various thermometers, thermostats and shut-off valves have been located so that they can be easily read or adjusted from outside the DC car. Make-up water may be added to the heat exchanger while the rectifier is in operation. An insulated hose is provided, as shown in Fig. 10, and terminates in a metal fitting. The fitting is grounded since it is fastened to the frame of the DC car. Therefore any make-up water strikes grounded metal before entering the hose and the shock hazard is minimized. A pipe plug is inserted in the open end of the fill pipe.

Manual water shut-off valves, visible below the hose in the center of Fig. 9, are provided in both lines to the headers to shut the water off if the hose connections must be tightened or replaced. These valves also are readily accessible from the aisle alongside the DC car.

The fan and its motor may be easily removed, should the occasion arise, by loosening the mounting bolts and swinging it out into the aisle.

The load-indicating resistors associated with the DC automatic reclosing equipment are mounted in the upper part of the surge tank and their heat is dissipated by the heat exchanger. Immersion-type resistors were chosen for this duty rather than open-type resistors which could overheat adjacent metal parts, blistering the paint and causing other damage.

Heavy neoprene-covered hose is furnished for the connection from the heat exchanger section to the rectifier tube headers. Shut-off valves are provided in the inlet and outlet connections on the heat exchanger for maintenance purposes.

SWITCHGEAR CARS

The metal covers of the switchgear cars have been designed to facilitate routine inspection and servicing. Where frequent access is required, hinged doors are used. Elsewhere removable covers are utilized. The side covers employ a wedge-type clip (Fig. 11) which fits snugly over the angle bracket on the floor of the car and assures a tight-fitting cover. Only two bolts are required at the top of these covers, which simplifies their removal and keeps loose hardware to a minimum. The car roofs are composed of easily handled steel sheets whose overlapping edges prevent dripping water from getting inside the equipment.

In a few mines the hoisting shaft is not large enough to accommodate the rectifier cars except by standing them on end. Where such an operation is necessary, extra diagonal bracing can be provided for the AC and DC cars, as in Fig. 12. These special braces are removed after the units are installed.

"Floating" axles are provided to help keep the cars on the track on poor roadbeds. Any of the wheels on the AC or DC switchgear cars can drop approximately 1 in to engage low spots in the track and help prevent the car from slipping sideways. Meanwhile the other wheels will provide a three-point support for the car's weight. The transformer car has only one floating axle, as shown on the low-voltage end of the car, Fig. 5. This axle is pivoted at the center and is attached to an angle bracket on the transformer tank. Stops are provided to limit the travel of the wheels and keep them properly aligned with the car. This type of construction is used on the transformer car because of the greater weight and different space requirements.

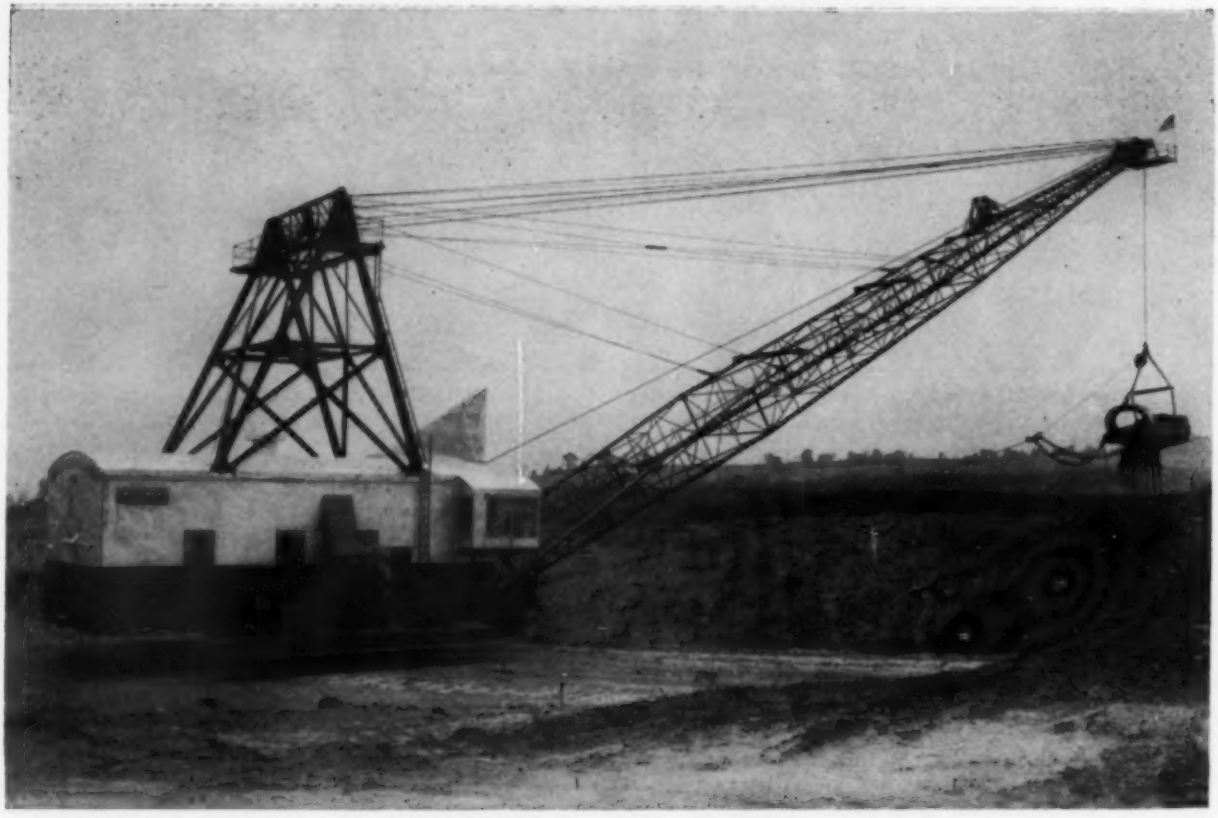
Coupler pockets are provided on the ends of all cars so that they can be pulled from either direction. The center line of the pocket is 5¾ in above the rails. Since the height of couplers on mine locomotives varies, an individually tailored Z-bar is furnished.

All power and control cables are furnished for connecting the three cars. The transformer primary cables are furnished with the AC car and the secondary cables with the DC car. A control cable also is attached to the DC car and may be looped over supporting brackets on the transformer car to a plug on the AC car. All interconnections are made within the confines of the three-car line-up without obstructing the available aisle space. Clamping blocks and terminals are provided for connecting the purchaser's incoming and outgoing power cables.

COMBATING DUST

In mines where there is more than the usual amount of coal and rock dust in the air, semi-dusttight construction for portable mining rectifiers is available at increased cost. The AC car is very similar to the standard model shown in Fig. 3. Since very little heat is generated in this car, the enclosing covers can be bolted up tightly and ventilating louvers are not required. The transformer car is already of sealed-type construction and does not require any modification.

The DC switchgear car requires ventilation. A motor-operated blower is provided which maintains a light positive pressure within the car. The inlet and outlet air openings are equipped with renewable dust filters. Fig 13 shows the semi-dusttight DC car with the inlet filter near the middle of the car. The heat exchanger is mounted outside the pressurized area and is surrounded by a screened enclosure. One large mining company has 13 of these semi-dusttight portable rectifiers in operation.



DRAGLINE with 12-yd bucket was added to Harmon Creek's stripping equipment in September, 1945, to uncover coal under more than 80 ft of cover. In separate pit, 15-yd shovel strips cover up to 80 ft.

Harmon Creek Goals: Profitable Stripping . . .

How a western Pennsylvania operator strips to an 80-ft bank with dragline and shovel, then restores the land to better than its original condition. Varied recreational facilities provided make an important contribution to community life.

By A. E. FLOWERS
Associate Editor, COAL AGE

EFFICIENT STRIPPING followed by a reclamation and conservation program that restores land to as good or better condition than before stripping marks the Florence mine of the Harmon Creek Coal Corp. as one of the coal industry's unusual operations.

Located at Burgettstown, Pa., on the Pennsylvania R.R., Florence mine is operating in an area where stripping began as early as 1917. The property was acquired by Harmon Creek in 1932 and since then has supplied Pittsburgh-seam coal for commercial use, steam generation, and domestic consumption to eastern Ohio and the Beaver Valley and Pittsburgh district in Pennsylvania. During the summer months, most of the smaller sizes of coal move to the Great Lakes for export to Canada while lump coal is stockpiled at the mine for sale to retail and truck customers the following winter.

The driving force behind the conservation program is James F. Hillman, president of Harmon Creek and a devout conservationist. He feels that the company has made a living from the land and therefore has an obligation to restore it to as good condition as before mining. As a result of the conservation program, residents of the Burgettstown area today have a 77-acre community park that includes wooded groves with picnic tables, outdoor fireplaces, shelter houses and a modern swimming pool. In addition there are swings, slides, shuffleboards, baseball field with dugouts and clubhouse, tennis and basketball courts.

An 8.7-acre lake was created between two spoil banks and turned into a recreation area for company employees. Fed by three springs coming out of the spoil banks, the lake has been stocked with bass, bluegills and catfish and provides excellent fishing.

To date, over 586,000 trees and shrubs have been planted over backfilled strip land. All planting is done under the supervision of Harmon Creek's forester. Trees are raised at the company nursery, which has been in operation since 1948.

UNCOVERING THE COAL

In September, 1954, Harmon Creek added a Bucyrus-Erie 9W dragline, equipped with a 12-yd bucket, to recover all coal remaining under thick cover. Up to that time, the stripping

RECREATION PARADISE for Harmon Creek employees and families is provided by 8.7-acre lake and picnic area created in reclaimed area. Lake is stocked with bluegills, bass and catfish and provides excellent fishing.

. . . Productive Reclamation

limit had been an 80-ft highwall with a 15-yd Marion 5321 shovel. Now stripping is carried out in separate pits by each of the units. The shovel is assigned to the areas with 80 ft or less overburden while the dragline handles the thicker cover and eventually will work to banks 120 ft high. Harmon Creek expects to recover all the remaining coal under thick cover with the dragline unit.

Strata over the coal consists mainly of shales but a 1- to 10-ft layer of sandstone also is present throughout most of the property. In the shovel pit, a Sullivan sidewall drill, equipped with Coalmaster augers and bits, bores blastholes 65 ft deep on 21- to 24-ft centers and 8 to 10 ft above the top of the coal. Drilling is done on a two-shift basis.

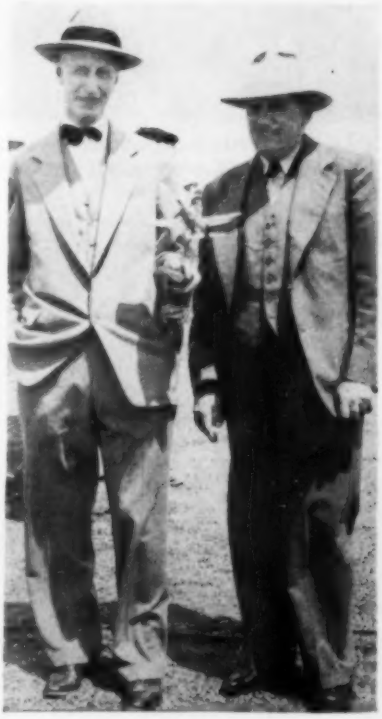
Holes are charged with 5½x20-in National or Atlas powder and detonated with electric blasting caps. A group of 12 to 14 holes, wired in series, is discharged each day, breaking a 50- to 55-ft-wide cut of cover.

A McCarthy vertical rotary drill, mounted on a Chevrolet truck, is available for spot drilling assignments when a particularly hard band of rock is encountered and the overburden is greater than 65 ft thick. When needed, the vertical holes are drilled on 21x21- to 24x24-ft squares.

To help the stripping shovel do a more effective job, when working in a high bank, a Caterpillar D8 bulldozer is teamed with it to remove the top of the spoil bank and at the same time carry out backfilling. The 5321 works round the clock, seven days per week.

Any coal with more than 80 ft of cover is assigned to the dragline unit. This means that the drag usually moves into an area after the 18-yd shovel has worked to its stripping limit.

Since going into operation in September, 1954, the dragline has been working in a pit previously stripped



STRONG BACKERS of reclamation program are President J. F. Hillman (left) and Superintendent Walter Robertson.

SIDEWALL DRILL works in No. 1 pit. Truck-mounted vertical and horizontal units round out drilling equipment.

SECOND STRIPPER takes 15-yd bite in 50-ft cut while working to 80-ft bank in second pit.

Harmon Creek's Stripping and Preparation

COAL LOADING in No. 1 pit is assigned to 3-yd electric shovel. Coal berm is left for truck road into pit.

STORAGE BIN at preparation plant holds 150 tons of raw coal, helping to smooth haulage and cleaning operations.

to a 75-ft highwall. Although it has removed up to a 270-ft swath of overburden when rounding a point, the 9W normally works in a pit 100 ft wide. A somewhat unusual method is used to remove the standard cut. The dragline actually takes two 50-ft cuts, alternating from side to side. Here is how the job is done.

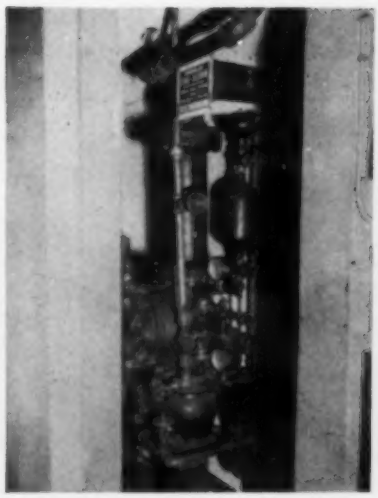
A Hardsocg horizontal drill, mounted on a Chevrolet truck, drills blastholes 60 to 65 ft deep on 25-ft centers and 5 ft above the top of the coal. Blastholes are drilled parallel to the highwall instead of perpendicular as with most sidewall drilling methods. Two holes are drilled in each 50-ft cut unless an unusual condition is met and there is a band of hard rock near the surface. In this case, an extra hole is placed above the two standard holes. A ramp is built for the drill truck so the extra hole can be started at least 6 ft above the others. It is angled upward so that maximum effectiveness can be obtained from the extra explosives. When the additional hole is needed, all three are loaded and discharged simultaneously. Two men handle the drilling job on a single-shift basis in the dragline pit.

Management reports that the method used in the dragline pit was developed after trying various other drilling and shooting techniques. Also, it has resulted in a larger percentage of lump coal from the pit—greatly desirable because of the increased realization.

The dragline stripping procedure is a step-cut operation with the outer 50-ft strip being uncovered ahead of the inner one. After experimenting with various drilling, shooting and stripping methods with the dragline, management found the present method to be most effective. Better fragmentation of the overburden with less explosives, less shattering of the coal and easier stripping are top benefits of the system.

Under no condition does the dragline work over the drilling unit. If the dragline has completely uncovered a section of overburden, it is walked ahead and put to work removing surface material that can be handled without blasting and where the bucket will not pass over the drill.

PREPARATION PLANT geared to process 2,000 tpd of Pittsburgh Coal features calcium-chloride washing, oil-treating, truck-loading and stockpiling.



AUTOMATIC sprinkler system protects preparation plant from fire.

Efficiently Geared to Handle 2,000 TPD

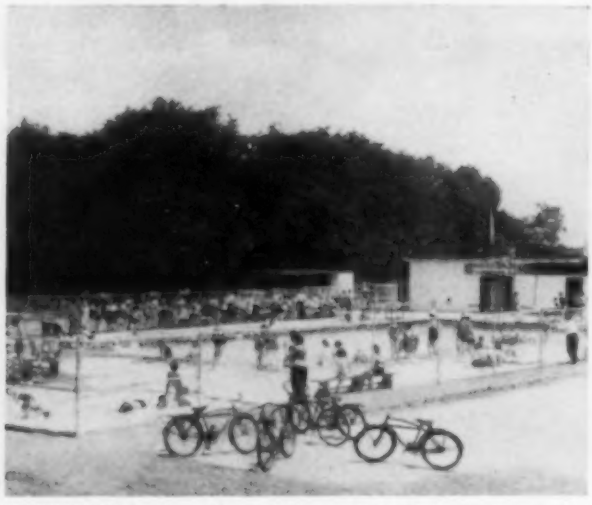
VIBRATOR separates 5x⅝ from 5x0 for delivery to washer. Fines pass either to railroad car or storage bin.

PRIMARY COAL CLEANING is handled by a calcium-chloride washer. Coarse middlings are reprocessed.

BELT AND SCRAPER CONVEYOR carry cleaned coal from preparation plant to retail storage bins.

SUPPLY CONTROL with perpetual inventory is centered in Purchasing Agent John Jones' office.

AFTER PLANTING, terrain looks like this 4 yrs later. Food-bearing plants aid game propagation.



SWIMMING and wading pools were built by company on 77-acre tract developed as community park.

"Restoration is an obligation . . . when a

FORESTER W. R. ALLISON inspects seedlings he raises at Harmon Creek nursery established in 1948.

PHEASANTS are raised by company from day-old chicks and eventually released to provide hunting recreation.

CLEANING AND LOADING COAL

A Caterpillar D7 bulldozer removes fine material from the top of the coal as the first step in cleaning the coal before loading. An International tractor fitted with a J. T. Hough sweeper then takes off any remaining fine material before loading begins.

Coal is loaded without shooting, the shock from overburden blasting being sufficient to loosen the coal. In the shovel pit, a Marion 480 electric shovel, equipped with a 3-yd dipper, handles the coal-loading assignment. A 3-yd P&H 855 diesel unit is detailed to the loading job in the dragline pit.

A fleet of 11 Mack diesel and gasoline tractors teamed with 16-ton Austin-Western trailers performs haulage duties in both pits. Sideboards have been added to the trailers to bring their capacity up to 18 tons. Eight of the units currently are operating in the No. 1, or shovel, pit while the remaining three haul from the No. 2, or dragline, pit. Coal is hauled approximately 5 mi to the cleaning plant over company-built roads. Two 9-ton end-dump Mack units haul cleaning-plant refuse to the strip pit, where it is buried, and carry coal on the return trip. Normally they operate in the shovel pit but sometimes are assigned to the No. 2 area.

ROADS WELL ENGINEERED

To permit haulage units to perform at maximum efficiency, Harmon Creek builds solid, well-graded roads with good alignment. There are no grades over 4½% and all large curves are superelevated. All roads are planned well in advance and when fills are needed to get the proper grade, they are built up at least a year before they are needed. A 1½ to 1 slope is maintained on all fills while a 1 to 3 slope is standard for all cuts. Concrete drain pipe is installed before fills are made to prevent accumulations of undesirable bodies of water.

Fills usually are made with shale which is compacted as filling progresses. Approximately 1 ft of cleaning-plant refuse is added to the completed fill and topped with 6 to 8 in of 2-in slag. The material is compacted and more slag is added as needed. Roadbuilding equipment at

BASEBALL FIELD, also built and maintained by company, includes bathhouses and dugouts for players.

SPECIAL AWARD by American Association of Nurserymen is received by Forester Allison, for company.

company makes a living from the land."

BACKFILLING and contouring with bulldozers is first step in land reclamation work. Scraper unit (right) spreads top soil over backfilled area before grasses and trees are planted. Company's program started in 1944.

Harmon Creek includes a LeTourneau scraper, Caterpillar and Austin-Western graders and Caterpillar D7 and D8 bulldozers. Road beds are maintained 60 to 65 ft wide so that the stripping equipment can be moved to new locations with minimum effort and maximum speed.

OPERATORS MAINTAIN UNITS

To keep down time to a minimum and maintenance costs as low as possible, Harmon Creek assigns to stripping- and loading-equipment operators the responsibility for maintenance of their units. The first-shift operators are responsible for servicing the machines and usually handle day-to-day maintenance work. If there is a big job to be done, all crews may be called out or as many men as needed. The first-shift operator acts as leader and directs the work.

Management reports that the system not only keeps the equipment in top condition but also develops job pride among the operators. Machine operators and helpers have increased their job skills and thus are more valuable to the company. Key men in the maintenance program are: Roy Peters, 5321 shovel operator; E. Bywaters, 480 shovel operator; E. F. Rumbaugh, P & H shovel operator; and W. Freeman, 9W dragline operator.

PREPARING THE COAL

Harmon Creek's cleaning plant processes 2,000 tpd while operating one shift. Trucks discharge raw coal into a 150-ton bin from which it is transferred by a Stephens-Adamson feeder to a 36-in belt conveyor for delivery to the plant. From the belt, coal flows to a double-deck vibrator and is separated into either plus 5 in and 5x0 or plus 4 in and 4x0 products.

Lump coal passes to a picking table and thence to railroad cars or to domestic storage bins. The 5x0 or 4x0 is delivered to the washer section and separated into 5x⅝ or 4x⅝ and ⅝x0 fractions by an Allis-Chalmers Ripl-Flo vibrator. The large product is delivered to a Belknap washer and the ⅝x0 is delivered either to railroad cars or to domestic bins.

The clean washer product is delivered to a double-deck Allis-Chalmers vibrator and separated into 5x2,

HARMON CREEK MEN ON THE JOB—E. J. Kapp (left), chief engineer; A. Boni, pit foreman; William Woods, preparation foreman; W. Collins, chief clerk; and R. M. Saxton, shipping clerk.

2x1¼ and 1¼x⅝ sizes. All three may be delivered separately, either to railroad cars or domestic bins as desired. The 5x2 or 2x1¼ may be sent to a Link Belt double-roll crusher when smaller sizes are needed. A Viking oil-spray system is available for dust-proofing all sizes.

Refuse from the primary Belknap washer passes over a bar screen and is separated into plus 1½-in and 1½x⅝ fractions. The smaller product flows to a 10-ton refuse bin from which it is hauled by truck to the strip pit for road-building purposes or burial. The larger material passes to a 25-tph secondary Belknap washer and the float product is reduced to ⅝x0 by a single-roll crusher and mixed with the raw ⅝x0 for delivery either to the storage bin or to railroad cars. Secondary refuse is delivered to the refuse bin.

DOMESTIC STOCKPILING

To assure truck customers of an ample supply of coal in the sizes desired during the burning season, stockpiles supplement the bin-storage facilities. During the summer months, lump coal is stockpiled near the cleaning plant to build up an adequate supply for the coming winter when daily output of the lump coal is less than the demand. Smaller areas also are reserved for stockpiling nut and stove sizes. Two Hough Payloaders and a Barber-Greene loader are kept busy during the burning season transferring coal from the stockpile to trucks.

RECLAIMING THE LAND

Backfilling of stripped areas and planting of trees was started in 1944 when Mr. Hillman decided that something should be done to restore the land. Instead of planting trees on piles of spoil as deposited by the stripping units, Mr. Hillman directed that backfilling should be done first to restore as near as practicable the original contour of the land. After this was done trees should be planted. Harmon Creek's reclamation program began before the present Pennsylvania reclamation law was passed and consistently has been to higher standards than those set forth in the law.

From its beginning in April, 1944, when 50 acres were backfilled and 14,500 trees planted, Harmon Creek has expanded its reclamation and conservation program to include development of various types of recreation areas along with the planting of 586,000 trees and reseeding over 1,055 acres of land. Initial replanting was started in the worst possible area in the belief that if it were successful there it would be possible to reclaim any of the other land. The initial planting was successful and the work was expanded.

The following year, 1945, after backfilling was carried out, 175 acres was seeded and 10,500 trees and 5,200 shrubs were planted. In each following year, additional land was reclaimed and seeded and more trees and shrubs were planted. All trees and shrubs were bought from commercial nurseries until 1948 when Harmon Creek hired W. R. Allison as forester and reclamation foreman. One of his first jobs was to establish a company nursery to grow trees and shrubs for the reclamation program.

Trees are raised from seed and include both conifers and deciduous types. Although Harmon Creek has been successful in growing a large variety of trees, the best results have been achieved with jack, pitch and table mountain pine along with locust.

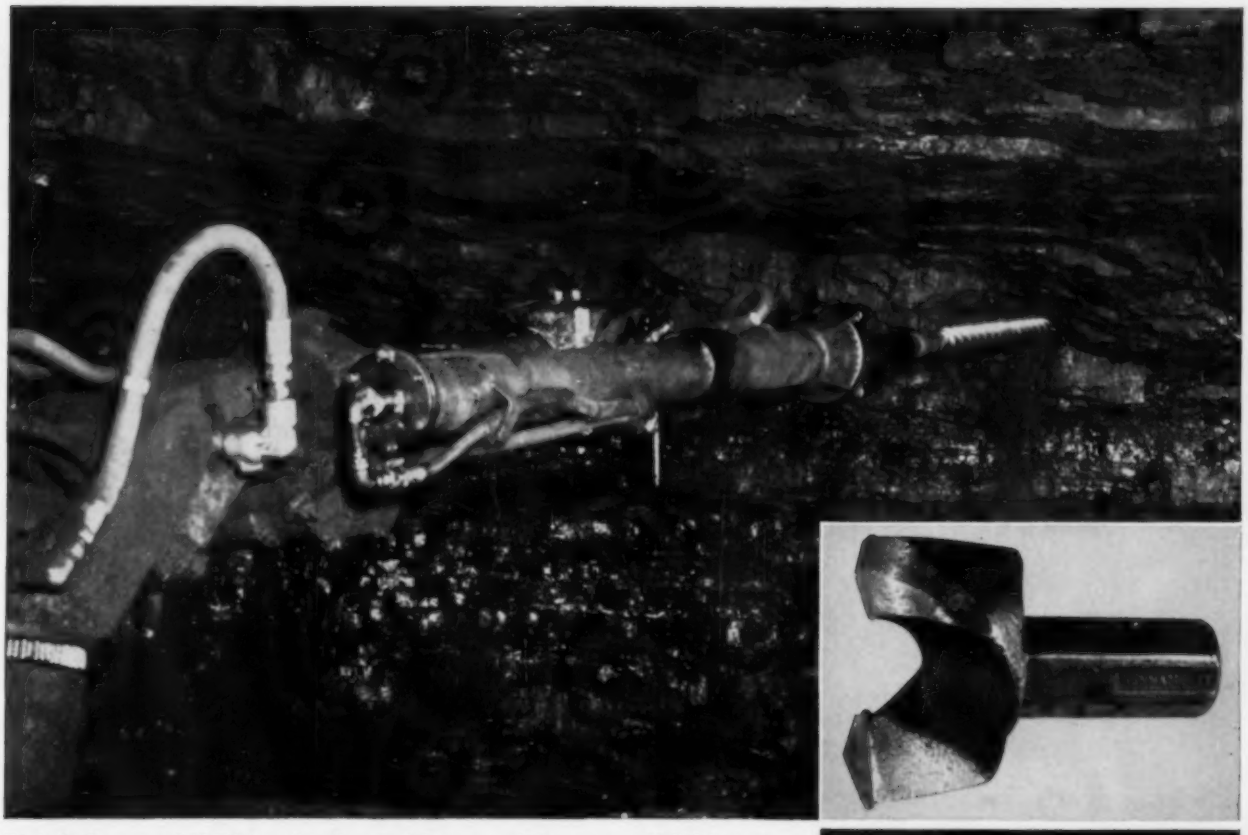
Experience has shown that if stripped land is not planted for 2 or 3 yr after stripping trees have a better chance to survive. However this practice has been found not to be particularly desirable because of erosion during the unplanted period. Sometimes areas are back filled, contoured and planted with grass and trees immediately after stripping so that erosion will be held to a minimum.

Backfilled areas originally were planted solidly with trees, but now a 100-ft strip is left between each 300-ft strip of trees to prevent spreading of any forest fires. To prevent erosion, the 100-ft strip is seeded with grass.

Conservation does not stop with restoring the land and planting trees and shrubs. A considerable sum is spent each year to increase the wild game population in the area. Each June, approximately 600 day-old pheasants are purchased from the Pennsylvania State Game Commission and transferred to brooder houses at Harmon Creek's pheasant farm. Male birds are released before and throughout the hunting season while hens are not released until the following spring.

In conjunction with the conservation program, it has been the custom to raise sufficient field corn to feed the pheasants and other game and song birds which are becoming more plentiful as trees, shrubs and grasses grow to provide food and shelter. The conservation program also includes predator control. In 1954, for example, 254 assorted enemies of wild life were trapped and destroyed. In addition to the increase in the number of small game, there has been notable increase in the deer population in the reclaimed area.

When the coal reserves are exhausted some 20 yr from now, residents of the Burgettstown district not only will have available a first-class recreation area but also will live in an area of beauty—unrecognizable as a former site of strip mining.



This is the Kennametal DB-3 bit used at Gem Coal Company, which gave over 10,000 feet of drilling at a bit cost of 1.2 mills, using a variable speed, variable thrust Jeffrey 56-FHR single arm, rubber-mounted drill.

1706 six-foot holes drilled with a Kennametal* DB-3-Inch Bit

"One third longer service with Kennametal drill bits than any other carbide bit that has been used" . . . reports Herman Jauchius, Superintendent of Mine 255, Gem Coal Company, Nelsonville, Ohio.

As a typical example performance in this mine, a Kennametal DB-3 bit completed 1706 six-foot holes or more than 10,000 feet of drilling in Hocking Seam No. 6 with 28 regrinds. Drilling speed per six-foot hole, using a Jeffrey 56-FHR drill, averaged 20 seconds.

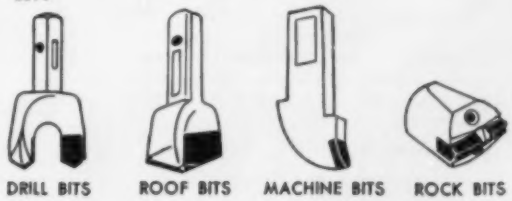
Approximately 190 places, 26 by 6 feet, are drilled per bit life, on an average, with production about 7100 tons of coal per bit. In terms of bit cost per ton, the Kennametal DB-3 bit cost $.0012 or 1.2 mills per ton of coal produced.

This is one example of why Kennametal bits are used so extensively. Try them in your operation and cut bit costs per ton of coal. Your Kennametal representative will help you put the right tool on the job. Call him today, or write to KENNAMETAL INC., Mining Tool Division, Bedford, Pennsylvania.

*Registered Trademark

Mr. Jauchius and face boss Fuller examine Kennametal drill bit, which has given long service and low bit cost per ton.

INDUSTRY AND KENNAMETAL ...Partners in Progress



nature resulting from stubbornness requires much more thought and effort. First, the cause of the stubbornness must be determined. Sometimes a young fellow may be uncooperative because he just doesn't want to work in the mines. He may have heard mother saying "I didn't raise my boy to be a miner," and father saying "My boy won't go in the mines, as I had to do." But then the young fellow gets married, and the only work he can get is in the mines. He takes it but he hates it, and this shows in his attitude. There is our hypothetical situation.

The foreman of course must concern himself with the young man's attitude, because this fellow may be a potential accident. He must try to show the young man that his job can be meaningful and worthwhile, or he must look for another spot for the young man if only in the interest of safety.

Similar attitudes in other men may come from different sources. A feeling of inadequacy may make a man combative or retiring to the point of being called either a troublemaker or a lazy one. The remedy is for the foreman to try to determine what irks the man, then take positive steps to correct the harmful attitudes. Good foremen acquire this ability to stir the consciences of others quite naturally. Foremen who feel that such matters are none of their business are costing their companies money.

IMPROVEMENT POSSIBILITIES

Thus, it is possible to improve a situation if a foreman keeps ahead of him the possibilities inherent in the human-nature factor rather than the penalties in the human factor. Burl Ives, the mountain troubadour, sings a song advising us to walk through life with our eyes upon the donut, not upon the hole.

Too often when the term human factor is mentioned we automatically think of it as a limitation on the effectiveness of some wonderful machine. Actually, as the other side of the coin shows, it is more often the machine that lets the man down somewhere short of a desired goal. There is an example of this in a new book entitled "The Good Shepherd," by C. S. Forester, author of the Horatio Hornblower stories. The new book also is a story of the sea, telling of convoy duty in the North Atlantic during World War II.

In his story, Mr. Forester gives a good example of how men must sometimes carry on when all mechanical aids lose their effectiveness short of a goal. A convoy is attacked by a U-boat pack. One of the escort destroyers picks up the trail of a U-boat through its submarine-detection equipment and closes in for the kill. As the gap between the destroyer and U-boat narrows, responsibility shifts from the sonar equipment of the two vessels onto the captains.

The U-boat captain must elude his pursuer, without help from his instruments. And success for the captain of the destroyer depends upon whether he correctly guesses the U-boat captain's intentions as the final maneuvering begins. One wrong turn will take the U-boat out of depth-bomb range.

A grisly example, no doubt, but it proves the point that sometimes man must outlast and out-think the machine. The higher skills which permit him to do this are the end products of a process of continuous development and training. He submits to training and profits from it only to the extent that he can discipline himself.

TOP-FLIGHT SUPERVISION

The top-flight supervisor, therefore, exhibits a number of characteristics. He is willing to concern himself in the fullest development of the men who work for him, and, like the destroyer captain, he knows there are times when he must rely on his own training, his own experience and his own ability to think.

There is one more attribute clearly visible in the performance of a top-flight supervisor. That is his ability to weigh the conflicting factors in a situation and to make sound judgments.

This brings to mind Red Smith's sports column in yesterday's newspaper. Mr. Smith was dealing with the relative abilities of boxing referees, and his thesis is that boxing commissions' rules are not written with good referees in mind. The judgment of a good referee is far superior to the rules. He knows instinctively when to stop a fight—he doesn't merely count knockdowns. He has a certain feeling for the contestants. On the other hand, the establishment of rules is one way to provide a basis for judgment in those instances where a less-experienced referee doesn't have any, Mr. Smith explained.

The top-flight supervisor, then, is a man who is capable of holding a whip over himself, he has assimilated his experience, and this experience provides him with strong foundations for sound judgment. He has learned that the "human factor" concept, with its limitations, should be subdued in favor of the human-nature factor, which is amenable to improvement.

Getting the Most Out of the Coal Show

WILL WE SEE YOU in Cleveland at the American Mining Congress' COAL SHOW, May 16-19? We hope you will be able to attend to get a first-hand look at the newest developments in mining machines and auxiliary supplies. If this will be your first trip to the show you might bear in mind these five hints:

1. This is a big exposition—you can't see all of it in one day and come away with anywhere near the total information available to you. The exhibition hall is divided into a number of distinct sections, each holding a number of exhibit booths. Choose one section, visit every booth in that section, then go on to another section. You will find the floor plan of the exhibit hall and booth-location aids in the official program which you will receive.

2. Don't be backward in asking questions of the attendants in the booths. They are there primarily to answer your questions on the uses and functions of their equipment.

3. Keep your eyes open for units you can use to solve problems at your mine. Take notes on your observations. Pick up a piece of literature which you can read later at your leisure. You will find large envelopes being distributed at some of the booths to keep your literature in order.

4. Lunch facilities are provided in the exhibit hall. Have a snack, and if possible, sit down somewhere to give your feet a rest. A full day at the Coal Show can be mighty hard on your arches because you will do more walking than you realize. (*Coal Age* and other exhibitors offer their booths as resting places.)

5. Don't forget the technical sessions. Study the program and make up a schedule of the meetings you wish to attend.

In case you missed it, you'll find a "Preview" of the Coal Show technical sessions and exhibitors' displays on p. 84-92 of this issue.

Daffynition—

BOSS: Guy who has to play the crank if his employees aren't self-starters.

On the Record—

When people start waiting to get out of this country instead of waiting to get in, we can start worrying about our system.

—*Bradenton (Fla.) Herald*
From *The Burning Question*, published by Nashville Coal Co.

Do You Need a New Fishing Rod?

If you do, COAL AGE stands ready to help you by paying you $10 or more for your Operating Idea. Jot down your idea on a piece of paper, telling us what it does, how it works and what benefits it brings. Include a free-hand drawing, if one is necessary, or a picture, if one is available, and mail the item to: The Editor, COAL AGE, 330 West 42nd St., New York 36, N. Y. Your "fishing rod" money will be sent as soon as your idea is published.

NEW

RED SADDLE

shuttle car cable

lasts 4 times as long*

See samples of this RED SADDLE Cable at Booth No. 1114 at the Coal Show in Cleveland.

Take the average life of the shuttle car cable you're now using. Multiply it by four. And you get the *minimum expected life* of the new Hazacord Red Saddle Hex-Tite Twin for shuttle car service.

The reasons for this greatly increased life expectancy? Look at the red portion of the illustration—that's a *preformed* protective wall of red neoprene which assures a uniformly thick fill between conductors . . . gives added security against short circuiting due to run-overs by heavy equipment . . . locks Hex-Tite conductors in place to prevent internal slippage.

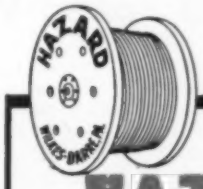
Now available to the mining industry for the first time, Red Saddle has all the other features that have made Hazacords first choice for rugged shuttle car service:

1. Hex-Tite non-slipping construction for longer life.
2. Compensated stranding to prevent opening-up of conductor strands when flexed.
3. Strong, resilient, heat-resisting insulation.
4. Tough, flame-proof, moisture and abrasion-resistant sheath.
5. Shaped conductors locked in place by solid sheath.
6. Extra flexibility for high-speed reeling.

*Actual tests on the special testing machine developed by Hazard engineers to simulate the pulling, twisting and bending of the severest mining machine service showed the new Red Saddle Type G Twin withstood more than four times the test cycles of old style Twin Type G.

And Type G Red Saddle Twins have a special *round* ground instead of the old-fashioned flat type. This exclusive design provides maximum protection between ground wire and power conductors, adds flexibility to the cable, markedly reduces ground wire breakage and consequent cable failures.

For full details on the new Hazacord Red Saddle Hex-Tite Twin, see your Hazard representative or write to Hazard Insulated Wire Works, Division of The Okonite Company, Passaic, N. J.



HAZACORD

Mold-Cured

portable cables

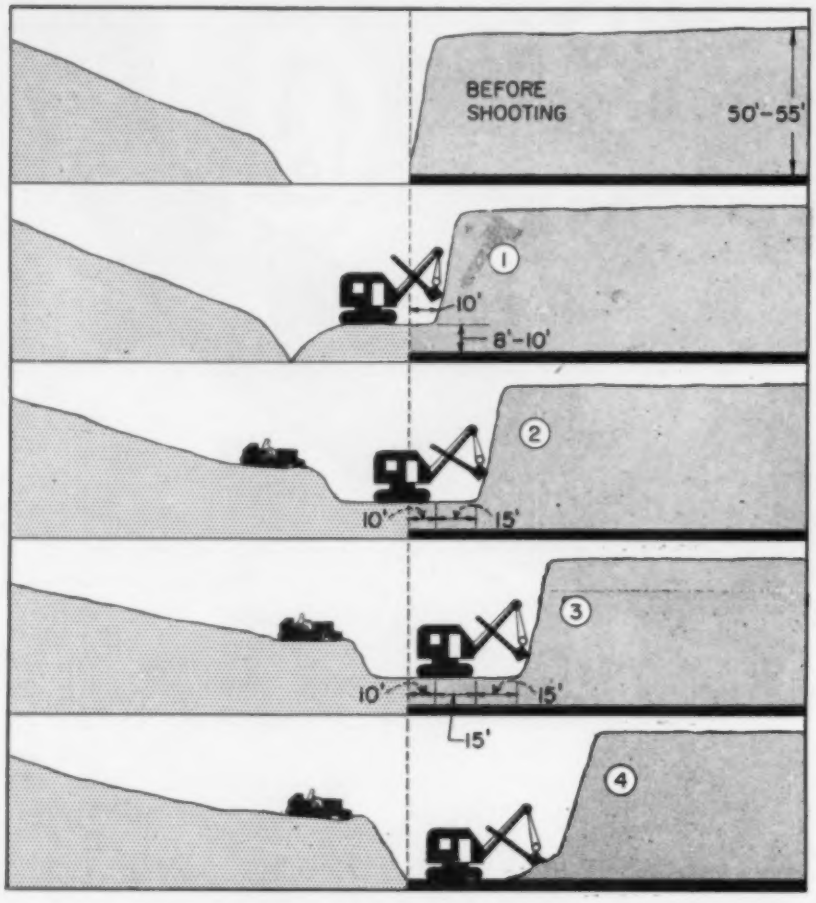
PRODUCT OF OKONITE RESEARCH

Trade-Mark applied for.

2723

OPERATING IDEAS

How to Move 55 ft of Overburden With Small Equipment



HOW CAN COAL BE RECOVERED efficiently from under 55 ft of overburden with a 2-cu yd shovel and a bulldozer? At best, that is a difficult question to answer. But it can be done. Here is how one operator teamed a 2-cu yd shovel and a bulldozer to move up to 55 ft of overburden. At the same time, backfilling was coordinated with stripping, leaving little additional work to be done to meet the requirements of the state mining law.

These are the steps in the stripping and backfilling operation:

1. **After the overburden is shot,** the shovel makes a working bench about 10 ft above the coal (Sketch 1). The shovel casts spoil ahead of it into the pit, taking a 10-ft vertical slice from the shot bank.

2. **Next it moves to the highwall** and starts a second bite, this time taking a 15-ft slice. Spoil is cast as far as possible.

3. **After this slab is removed,** the shovel again moves toward the highwall and starts a second 15-ft bite. After this slice is completed, the pit is 40 to 45 ft wide.

4. **The remaining 8 to 10 ft of material** in the pit is removed by the shovel from a position in the middle of the pit.

While the shovel is stripping, the bulldozer works in the spoil area, keeping the material pushed away from the shovel and leveling the area. The result is a uniformly sloping spoil area that requires little or no additional work to meet the requirements of the state mining law.

Charts Speed Ventilation Calculations

COMMENTING on the ventilation nomograph appearing in the January, 1955, issue of *Coal Age*, p 94, Carl Lee, retired chief engineer, Peabody Coal Co., agrees that a nomograph is more accurate and faster than calculating through the basic formula. Mr. Lee developed a somewhat similar chart some years ago. About 10 yr ago, Mr. Lee reports, George Ember, of Peabody's Chicago office, worked to further improve this labor-saving device by solving the equation $h = \frac{KLPV^2}{5.2A}$ by using cfm of air directly in the equation.

Definitions of equation units are:

h = air static pressure drop, in water
P = airway perimeter, ft
L = airway length, ft
A = airway area, sq ft
V = air velocity, fpm
K = friction factor

$$\text{Since } V = \frac{\text{cfm}}{A}$$

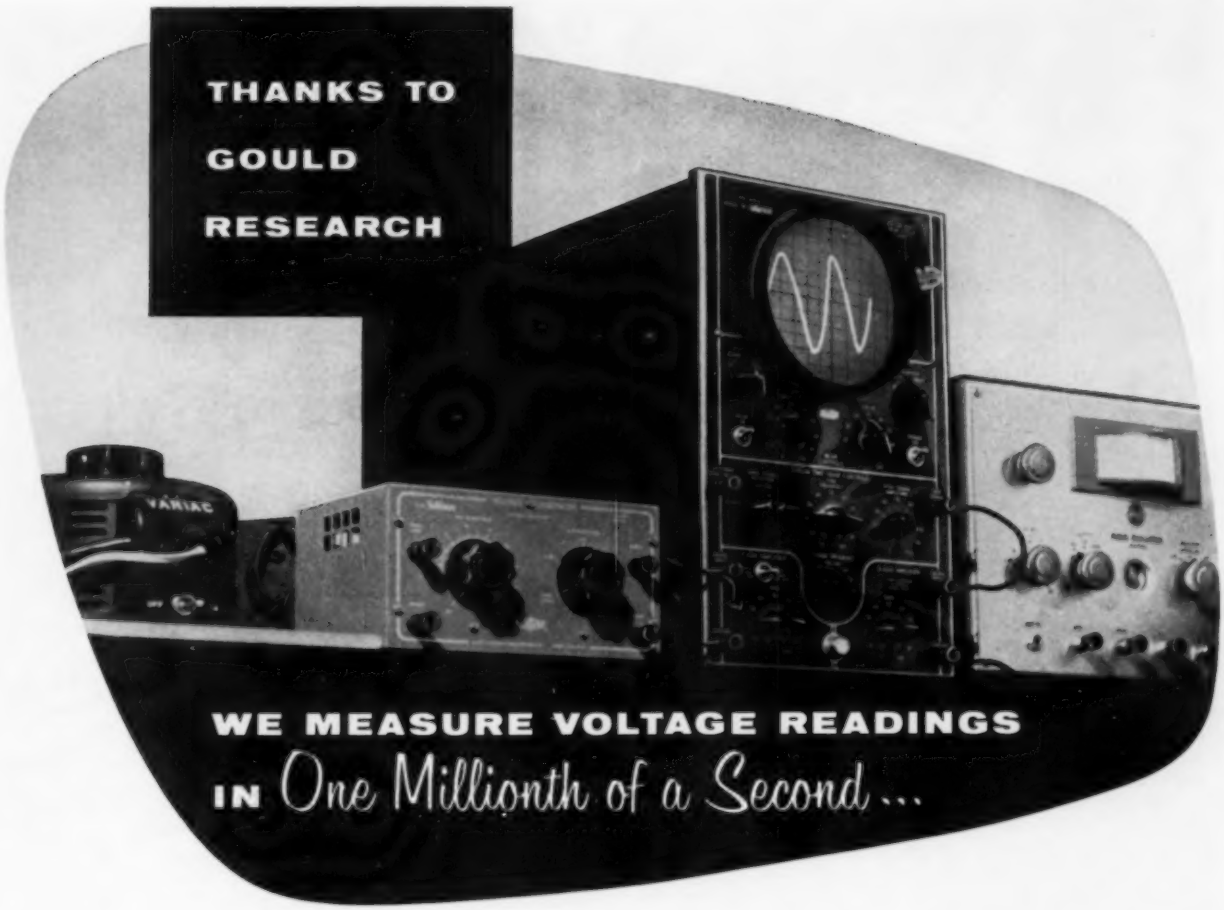
$$\text{And } V^2 = \frac{(\text{cfm})^2}{A^2}$$

The formula can be written as

$$h = \frac{P}{5.2A^3} K(\text{cfm})^2 L$$

The first portion of the equation is calculated from the shape characteristics of the entry, shaft or tube. Mr. Ember incorporated this portion into a chart that permitted rapid calculations so that in complicated multiple-split mine-ventilation problems he could try several arrangements to see which looked better.

An interesting outcome of the chart was that Messrs. Ember and Lee were able to apply it to many operating mines and solve for the vague, indefinite constant K. Thus with a suitable value for K, they were able to design the Peabody No. 10 mine with adequate air courses engineered in advance to the proposed layout and working plan.



TO GIVE YOU GREATER BATTERY DEPENDABILITY!

Practically instantaneous voltage readings are made possible by the Oscillograph shown above. This important laboratory instrument has enabled Gould research technicians to 1) carry on the study of battery performance under instantaneous loads of fast circuit-breaker operation; 2) study the response of a battery to high charge rates; 3) attain more closely a perfect balance between grid design and active material.

This kind of basic research, in one of the finest battery research laboratories in the world, has given Gould Batteries service life and dependability thought impossible only a few years ago. That's why Gould Batteries are today's best battery buy. Specify GOULD!

For the full story on Gould research, send for Booklet 749.

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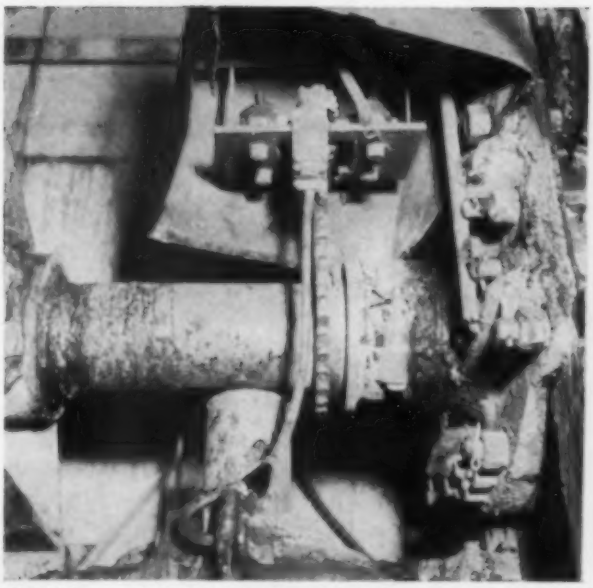

SHEAVE on drill-feed shaft connects to electrical mechanism (left) which records depth on operator's panel (right).

Electric Logging Device Measures Rock Thickness Accurately

MORE EFFICIENT use of explosives in strip mining is possible if you know how thick and how tough each layer of rock is. Explosives can be concentrated in the harder strata and used economically in the weaker material. This electric logging device, installed on a Bucyrus 50R overburden drill at The Colonial Coal Mining Co., Madisonville, Ky., was developed to measure the thickness of each rock strata.

The device was developed shortly after the 50R drill was put in service in 1954 when management learned that logging a hole by type of rock alone was not satisfactory. A significant variation in drilling pressure was not noted when drilling in the same type of rock, indicating changes in hardness. Management felt that an accurate method of recording each change of hardness was needed so that explosives could be used more efficiently.

J. A. Miner, president, conceived the idea for a device that would measure electrically the footage drilled. He believed that a device could be attached to the rack and pinion shaft of the drill feed to operate an electrical device recording the depth on the operator's control panel. With such an instrument the drill operator could record the thickness of each strata for each change in drilling pressure.

The job of working out the details of the mechanism was assigned to Aubin Mitchell, electrician, and H. S. Pickens, machinist, who collaborated to make the present unit.

Here is how the device works. A split-collar sheave was mounted on the rack and pinion shaft of the drill feed. From this a V-belt was connected to another wheel on an electrical mechanism. As a revolution of the second smaller sheave is completed, a pin operates an electrical contact which in turn operates a counter on the operator's panel. The drill operator merely watches the pressure gage and when pressure changes significantly, he notes the depth as registered on the counter and also the new pressure in a log book. Thus an accurate record is obtained for each hole. Results are given to the shotfirer who uses them as a guide in loading holes.

A switch in the electrical circuit permits the counter to be cut out during bit changes, hole reaming or any movement of the bit other than drilling.

Board Support Reduces Screen Maintenance

FEWER broken crossbraces on Parrish-type shaker screens has been made possible by installing this simple support to the bottom of the screen frame. Installed in the Georgetown preparation plant of the Hanna Coal Co., Adena, Ohio, the support consists of a piece of 1x4-in board, one end of which is bolted to a steel column of the building and the other to the far side of the shaker screen. The board acts as a stabilizer, keeping the screen shaking back and forth in a straight line.

Hanna's engineers came up with this idea as part of a continuing program to improve equipment so that down time can be kept to a minimum. A short delay to repair a sizing screen handling 750 tph or better is very costly because of the loss in tonnage while the plant is idle. And therefore every effort is made to make any alterations that will keep equipment running. This simple support has achieved that with the shaker screens.

COULD FILL 48,000 RAILROAD CARS PER MONTH! Owned by a major coal company, this electric shovel weighs approximately 3,500,000 pounds and has a dipper capacity of about 50 cubic yards. Nevertheless, the mammoth machine is capable of climbing grades steeper than 20%! To help it achieve maximum performance in this grueling work, its owners, after testing nearly every major brand of gear lubricants, chose Cities Service L Compounds for the job. The results have justified this choice.

BIG job . . . BIG machine . . . BIG lubricants!

Gear Oils Of Almost All Major Refiners Were Tested In This Giant Shovel. Cities Service Got The Job.

This giant 50-yard shovel is one of several currently in use by a major coal company. This same company also employs in its strip-mining operation, an extensive fleet of haulage trucks, bulldozers, earthmovers, coal preparation plant equipment, and miscellaneous vehicles.

Not long ago, it was decided to attempt to simplify and standardize the gear oil requirements of this equipment. Following this plan, the company first tested the gear oils of nearly every major refiner. The result: Cities Service L Compounds were chosen to do the job!

Again and again, where there's a big job to be done, mining men turn to Cities Service . . . because they've found Cities Service lubricants do the job better, do it easier. And the same is true of Cities Service Lubrication Engineers. If you have a lubrication problem . . . or if you'd simply like to check the efficiency of your present lubrication procedures, why not call in an expert Cities Service Lubrication Engineer. Simply contact your nearest Cities Service office or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS

SEE THE CITIES SERVICE EXHIBIT AT THE 1955 COAL SHOW • BOOTH 724 • MAY 16-19 • CLEVELAND, OHIO

Pneumatic Salt Handling Simplifies Freezeproofing

FREEZEPROOFING COAL with Morton Formula 5 salt has been made a simple job with a pneumatic conveying system at The Colonial Coal Mining Co., Madisonville, Ky. Salt is stored in a steel building near the preparation plant and blown through plastic pipe to railroad cars by a salvaged mine blower fan.

Here are the six steps in delivering salt to the railroad cars:

1 A bag of salt is emptied into a small hopper attached to a chute hinged to the top of a larger hopper.

4 The fan discharges the salt and air mixture into a 3-in plastic pipe that carries it to the preparation plant. There it is split into two streams for delivery to either or both Nos. 1 and 2 tracks.

2 A hand windlass is used to raise the small hopper above the level of the larger bin. Salt then flows into the larger bin. The larger bin holds 10 of the 100-lb bags of salt.

5 Each circuit is split at each track so salt can be distributed to both sides of the railroad cars. The 3-in pipe over each track is fitted with an adjustable Y to which are attached 1½-in-diameter hoses that carry the salt to the sides of the car.

3 A Syntron vibrator under the larger bin feeds salt to the mine blower which is belt driven by a 1-hp motor.

6 Salt is blown evenly over the coal as it is being deposited along the sides of the car.

Fiatt, Illinois Mine uses STANOIL *Industrial Oil in stripper hydraulic jacks for 18 years*

At Truax-Traer Coal Company's Fiatt, Illinois, mine, the production goal is 1,000 tons of coal an hour. That's a stiff assignment. It leaves no margin for failure. This indeed applies to the hydraulic jacks of the company's Bucyrus-Erie 950-B stripper. It's the reason STANOIL Industrial Oil has been used as the hydraulic fluid in the four hydraulic jacks since the stripper went into operation in 1937. Eighteen years continuous service is testimony to STANOIL's ability to deliver under any operating condition—heat, cold, rain, dust, dirt.

But there's more to the story than just the ability of STANOIL Industrial Oil to deliver under a wide range of operating conditions. The rest of the story is the Standard technical service provided by men with training and experience.

This combination — (1) top quality products (2) technical service provided by experienced men — is ready to serve you. Want this combination to go to work for you? In the midwest just call your nearby Standard Oil lubrication specialist. Or contact: Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Since start of operations in 1937, STANOIL Industrial Oil has been used as hydraulic fluid in Bucyrus-Erie stripper at Truax-Traer Coal Company mine, Fiatt, Illinois. This 950-B stripper is hub of one of the biggest strip mining operations in Fulton County, state's second largest coal producing county.

Bob Wright, Standard Oil lubrication specialist is on the spot to provide technical service on lubrication problems. Bob has a B.S. in engineering from Michigan College of Mining. Before entering field sales work, Bob completed Standard's Sales Engineering School course in industrial lubrication. Customers find this experience and background pay off for them.

STANDARD

STANDARD OIL COMPANY
(Indiana)

FINANCIAL AID TO HIGHER EDUCATION

Business Help for Our Colleges A Job for All Business Firms

IN recent months, individual business firms have announced the adoption of a variety of plans, both imposing and ingenious, for financial aid to higher education in the United States. In doing so, they have taken a lead in dealing with a problem of transcendent importance both to the business community and to our nation as a whole.

Previous editorials in this special series have shown that:

1. Our colleges and universities, and particularly the independent, privately endowed institutions, are in grave financial difficulties.
2. These difficulties promise to become much more acute in the years immediately ahead unless extraordinary steps are taken to relieve them.
3. A financially crippled system of higher education is a major national menace.

If, however, the business community is to play an adequate part in helping our colleges and universities financially, the plans adopted by business firms thus far constitute merely a beginning and a set of guide posts. What is required is a general movement on the part of business firms to go to the financial aid of higher education. Such a movement would involve a myriad of individual company plans which, in the nature of the case, cannot be expected to bring great renown or publicity to their sponsors.

Rescue Operation Is Feasible

For the business community as a whole it is feasible to make a major and possibly a decisive contribution to putting our colleges and universities back on their feet financially. One percent of business profits before taxes would do it. In 1954 business profits before taxes were about $35 billion. If one percent of these profits, or $350 million, were contributed to our independent, privately endowed colleges and universities it would enable these institutions (1) to increase the salaries they pay by $200 million a year, and (2) to provide $150 million more for modernization and maintenance of their establishments. In the opinion of competent authorities, this would put these institutions in relatively good working order financially, a process to which a matching grant of $50 million by the Ford Foundation for the improvement of faculty salaries will make a large contribution. It would add about one-fourth to their present annual outlay of about $1.4 billion.

Such a contribution from business would not meet the needs of the independent institutions for new buildings and equipment required to accommodate the great increase in college enrollment anticipated in the years immediately ahead. Neither would it relieve the financial problems of our tax-supported colleges and universities. As a group these institutions have fared better financially in recent years than the

independent institutions. But they also face grave financial problems, particularly in the provision of adequate faculty salaries. It would be far simpler, however, to solve the financial problems of the tax-supported institutions if the independent colleges and universities were back on their feet financially.

One Dollar Does Work of Two

The federal government exempts 5 percent of business profits from the tax imposed upon them if the 5 percent is devoted to religious, charitable or educational purposes. (Most profits are taxed 52 percent.) A contribution of one percent of business profits to higher educational institutions would exhaust only one-fifth of this allowance. It would bring to about two percent the total share of business profits going to both educational and charitable purposes.

In 1953, business firms contributed about $400 million, or slightly more than one percent of profits before taxes to educational and charitable purposes of all kinds. Of this total about $75 million went to educational institutions, mostly colleges and universities.

For some companies it is feasible to contribute more than the average contributed by business generally. Indeed, some companies not only utilize their full 5 percent of tax-deductible funds for charitable and educational purposes but go beyond it. For other companies in financial difficulties no contribution at all is possible.

If, however, those business firms for which it is financially feasible contributed one percent of their profits before taxes to our colleges and universities, the problem of adequate support for the crucially important business of higher education would be far along the way to successful solution. **In 1954 a contribution of one percent of their profits before taxes, or about $350 million, would have reduced business profits after taxes by only about half that amount. This would have meant a reduction of about $175 million, out of a total of about $17.8 billion of profits after taxes.**

Attractive plans to channel financial aid from business to higher education have been abundantly demonstrated recently. These plans, for the most part the creation of large corporations, have included not only a broad array of scholarship grants, but such ingenious arrangements as that by which a company matches with its funds the gifts its employees make to the colleges of which they are alumni.

A full array of these plans, some of which were discussed in an earlier editorial in this series, has been prepared by The Council for Financial Aid to Education (6 East 45th Street, New York City 17) and is available for the asking. Also, colleges and universities have established in most states and regions cooperative associations to help business help them. The Commision on Colleges and Industry (912 Kahn Building, Indianapolis 4, Indiana) distributes a directory of these associations. And, of course, the colleges themselves are always eager to discuss their financial problems with business people and suggest constructive solutions.

Only Small Start Made

The plans for business aid to education which have recently attracted national attention constitute the conspicuous sort of leadership which it is the privilege and opportunity of our great corporations to provide. But the job is too large to be handled by a small number of business firms, no matter how bold or ingenious their programs.

To put our colleges and universities back on a firm footing financially the help of the great rank and file of business corporations is required. All of them, large and small, have a crucial stake in seeing that this job is done. The future of America will be decisively shaped by what happens in and to our college classrooms.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

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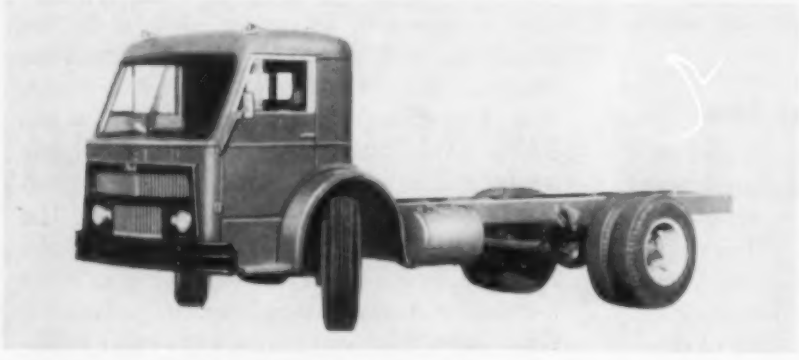
Donald C. McGraw

PRESIDENT

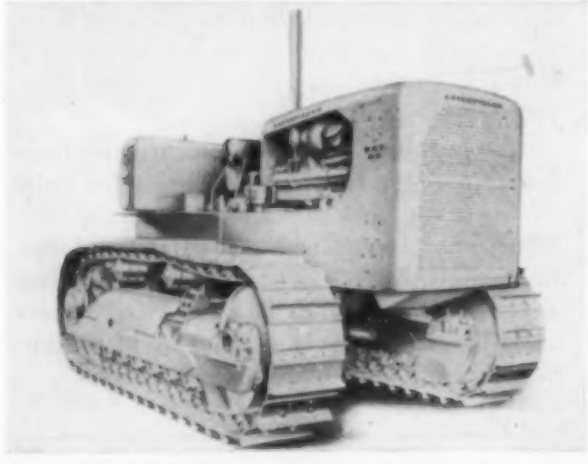
McGRAW-HILL PUBLISHING COMPANY, INC.

EQUIPMENT NEWS



More Truck Payload, Easier Servicing

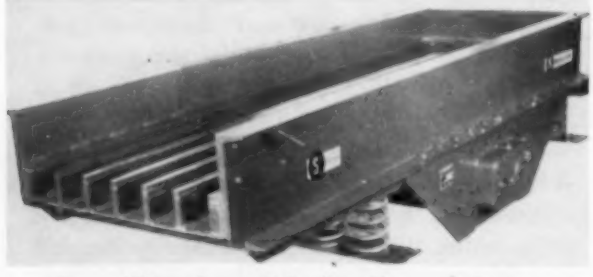
A radically new cab-over-engine truck series, said by the maker to be the most compact in the industry and featuring a cab that power lifts vertically from the chassis for easy servicing, has been announced by Mack Trucks, Inc., 350 Fifth Ave., New York 1. The "Verti-Lift D Series" Macks are built in truck sizes from 20,000 to 28,000 lb GVW and as tractors in the 40,000- to 53,000-lb gross combination weight range. The compact cab of D models is 12 in shorter than any C.O.E. now offered in the industry and up to 50 in shorter than conventional types, which permits either shorter over-all length or 1 ft extra for cargo space, the company points out. Greater maneuverability, larger payloads accomplished by light chassis weight combined with an engineering design distributing more load on the front axle; maximum driver visibility; and increased driver comfort are among other features cited. Maximum accessibility to the engine is quickly achieved by raising the cab vertically, using a hand pump or by optional hydraulic power, and no additional shop space is needed since the cab is raised without disconnections of any kind, it is said. The standard engine in the D-20 models is the 290-cu in Mack "Magnadyne" gasoline unit developing 107 brake hp at 2,800 rpm; in D-42 models a 150-hp Mack Magnadyne of 401-cu in displacement. They are offered with a wide selection of optional components, in four- and six-wheel models and in various platform lengths.



New 230-Hp Tractor Provides 30-Ton Drawbar Pull

Newest and largest of the Caterpillar track-type tractors is the 56,000-lb 230-drawbar horsepower D9, announced May 1. Power is provided by a new 6¼ x 8 6-cylinder "Cat" diesel engine with turbocharger, delivering 286 hp at 1,200 rpm for both the torque-converter and direct-drive models. The torque converter, 5:1 multiplication, provides speeds up to 7.8 mph—three forward, two reverse. The direct-drive unit has six speeds forward and reverse, 1.6 to 6.8 mph, with 60,860-lb drawbar pull with adequate weight and traction. A 6-v electrical starter is provided for the 2-cylinder starting engine. Available attachments include the 9S and 9A bulldozers, push cup, and front and rear cable controls.

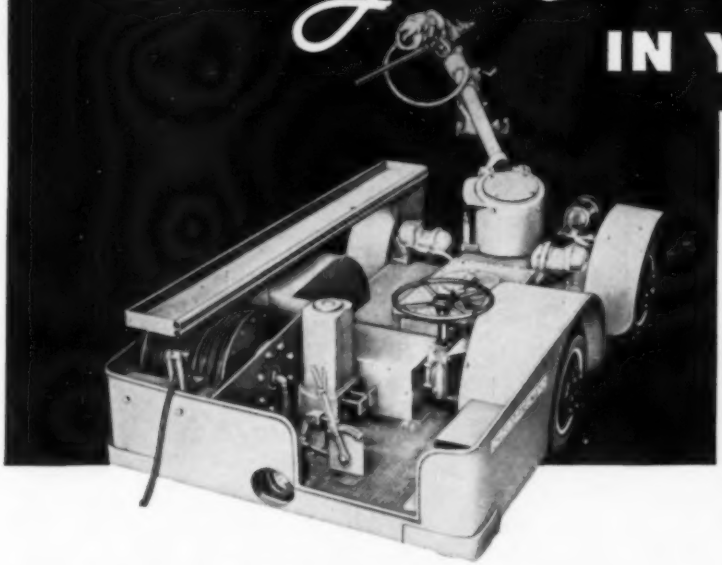
Specifications include the following: length, 17 ft 10 in; width, 9 ft 11 in; height, excluding exhaust pipe and air cleaner, 8 ft 9 in; ground clearance, 21 in; gage, 90 in standard; seven-roller track frame and fixed drawbar; 24-in-wide standard track shoes; bearing surface on ground, 6,228 sq in; 27- and 30-in shoes optional; weight per drawbar horsepower, 235 lb. Operator convenience, comfort and safety were given special attention in design. Caterpillar Tractor Co., Peoria 8, Ill.



Oscillating Unit Combines Scalping and Feeding

A new oscillating feeder with a grizzly deck now is available from the Simplicity Engineering Co., Durand, Mich. Combining the dual operations of the old-type apron feeder and the stationary grizzly, the Simplicity "Grizzly-Feeder" can cut operating and maintenance costs 50% and also utilizes only half the space previously required, the company reports. It is available in sizes 2 x 8 to 6 x 12 ft, in capacities up to 1,000 tph. Among the features cited are an unusual double-shaft assembly that permits the unit to feed on the horizontal when headroom is at a minimum, and a grizzly-deck construction that makes possible the use of new abrasion-resisting alloys. The twin shafts may be easily timed to vary the angle of the throw, thus determining the angle at which the grizzly deck will scalp material most efficiently. Wearing surfaces can be equipped with replaceable liners, and the unit may be either spring-mounted or with spring-and-cable suspension.

Bring out the best IN YOUR MINE



CP Permissible Tramdrill – can be driven in seams as low as thirty inches. Drills shot holes in coal up to 4½" in diameter within four inches of roof or bottom. CP tramdrills are all-electric – drill arm controls are within reach of operator. Available for single or double arm operation.

Wherever you find outstanding safety and economy records you'll find Chicago Pneumatic equipment. That's why CP's Mobile Permissible Roof Bolting Units . . . Single and Double-arm Permissible Tramdrills . . . Roof Bolt Stopers and Impact Wrenches . . . Hand-held and Post-mounted Permissible Coal Drills . . . and many other pneumatic, hydraulic and electric tools for faster, safer, more efficient mine operation and maintenance, are specified by operators everywhere. *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, New York.*

RBD Permissible Mobile Roof Bolting Unit – completes entire bolting cycle in 3 minutes flat – auger and bolt setter are driven by same motor. Telescopic chuck has 10 inch auger adjustment to conform to roof irregularities. Unit is equally efficient in high as well as low seams.

CP-572 Permissible Hand-Held Coal Drill – weighs only 43 pounds – is a real work horse – has safety clutch for automatic release if auger sticks, protecting both operator and motor.

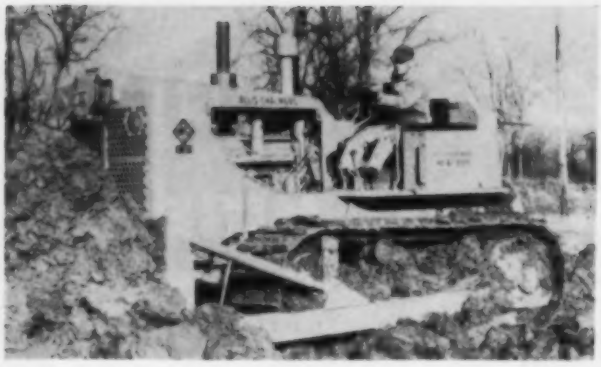
CP-574 Permissible Post-Mounted Coal Drill has drilling speeds up to 40 inches a minute—drills 40 to 60 holes per shift.

★ *Visit* OUR BOOTH 1513 AT THE 1955 COAL SHOW MAY 16 TO 19.

CP

Chicago Pneumatic

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

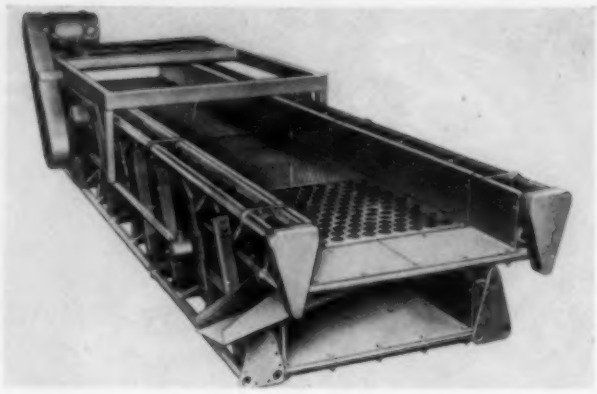


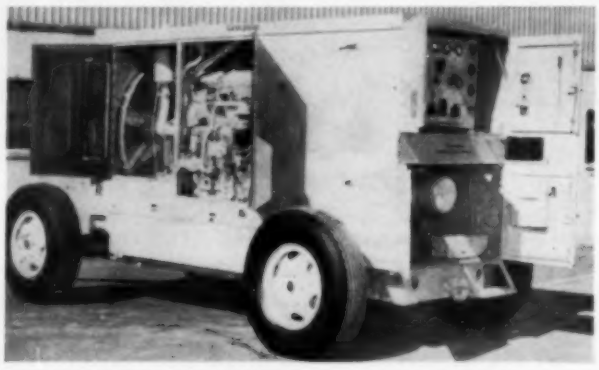
150-HP Diesel Crawler Tractor

Its second completely new crawler tractor this year—the 31,500-lb HD-16 available with torque-converter drive and standard transmission—has been announced by the Allis-Chalmers Mfg. Co., Tractor Div., Milwaukee 1, Wis. The HD-16 has the new A-C 6-cylinder 844-cu in diesel engine which develops 150 net engine hp at 1,800 rpm with torque converter and 140 net engine hp at 1,600 rpm with standard transmission. Maximum drawbar pull of 60,000 lb is obtained with torque-converter drive, while the standard-transmission tractor has a maximum drawbar pull of 31,700 lb at rated engine speed. New features cited for the HD-16 include "Wrap-Around" radiator guard which tilts forward and down for easy accessibility; A-C diesel engine and matched torque converter power team; extra long-life ceramic master clutch lining; newly engineered power train with correct gearing for developing the high drawbar pulls plus big reserve capacity to provide maximum productive hours on the job; and the new "Tru-Dimension" track especially designed for long life and maximum toughness of all parts. The HD-16 has a new line of matched equipment designed especially for it. The new "Wrap-Around" radiator guard reduces the cost of the tractor-dozer packages because the hydraulic rams or cable-lift sheaves mount directly on it, thus eliminating the need for a separate dozer lift frame, the company points out.

Vibrators Offer More Active Screening Area

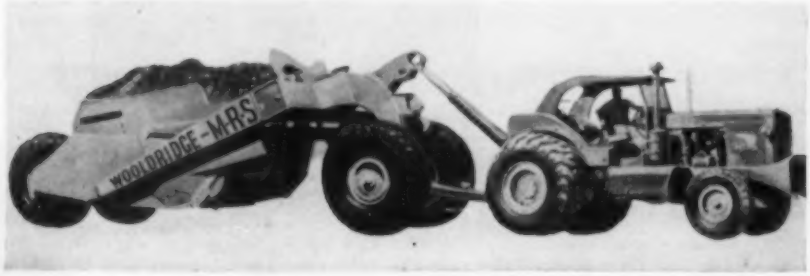
A new series of Model 2-B "Dual Deck Balanced" vibrating screens has been announced by the Syntron Co., Homer City, Pa. Guide links permit the dual decks operating in reverse motions to follow the eccentric drive movements, counterbalancing each other, and the normal reaction-absorption of large single-deck screens is utilized by the bottom deck to provide a more active screening area, the maker points out. The screens operate at the relatively low frequency of 1,000 vibrations per minute and the high amplitude stroke of $\frac{5}{16}$ in to provide efficient dewatering, scalping, dedusting, and coarse and medium sizing of materials. The Model 2-B is available for either suspension or floor mounting, installed horizontally or declined, in any specified length, and can utilize various screen constructions and openings, it is said. Two common sizes, 40 in by 15 ft and 40 in by 20 ft, utilize a 5-hp motor for starting the inert masses in motion. Since the springs and the two decks work close to the natural resonance of the system, however, the only power required when operating is that necessary to keep the springs moving, it is pointed out.





Portable Generators Provide 18 to 300 Kw

To meet the need for easily portable electrical generating units used in special situations or emergencies, Caterpillar Tractor Co., Peoria, Ill., now offers a complete line of 10 mobile and skid-mounted diesel-electric sets. Caterpillar has announced four units patterned after its big 300-kw "Mobile Electric Set," which is mounted on a van-type tractor trailer and has been in use for emergency power for 3 yr. Five smaller units are being offered as skid-mounted packages, and there is one specially mounted electric set, originally designed for the Air Force. In the four trailer-mounted units Caterpillar offers a choice of eight voltages and a wide range of electrical power: 300 kw in the D397; 230 kw in the D386; 200 kw in the D375; and 155 kw in the D364, continuous duty. In the Caterpillar D337, D326, D315, D318 and D311 skid-mounted electric sets, power ranges from 116 kw in the 1,200-rpm 60-cycle D337, to 18 kw in 1,000-rpm 50-cycle D311. Each skid-mounted electric set is offered with a choice of 60-cycle or 50-cycle, voltage and phase. Generators are either self-regulated or externally-regulated. The special electric set (photo) is a totally enclosed self-contained trailer-mounted Cat D364 diesel-electric set with a 150-kw 60-cycle 3-phase 440-v generator and switchgear.



Scraper Line Offers Five Models Up to 32.5 Cu Yd

The Wooldridge Mfg. Div., Continental Copper & Steel Industries, Inc., Sunnyvale, Calif., and the M-R-S Mfg. Co., Flora, Miss., have jointly announced a line of four-wheel cable-operated scrapers specially designed for use only with M-R-S tractors. The five new models have heaped capacities ranging from 10.5

B.F.Goodrich

Rock mover gets 6,000 hours of service, 2 recaps from All-Nylon tires

J. Robert Bazley, Inc., operates 260 units throughout central and eastern Pennsylvania. This Pottsville company moves rock, gravel and earth, constructs highways, does contracting and mechanical engineering, in addition to coal hauling. Trucks work as many as 21 hours a day carrying loads averaging 20 tons over rock and coal-strewn roads.

"WE RECEIVE 65,000 to 85,000 miles from *all-nylon* B. F. Goodrich Traction Express tires on the same jobs where 40,000 miles was considered excellent from other tires," says Mark Yoder, whose company hauls coal over Pennsylvania and New Jersey highways.

B. F. Goodrich *all-nylon* tires have worked 3,000 hours on the original tread, then put in an additional 3,000 hours on 2 recaps! Says Vice President James Bazley: "B. F. Goodrich *all-nylon* tires give us more recaps per tire and keep down-time and costs appreciably lower."

Why All-Nylon tires cut costs

Nylon is stronger than ordinary cord materials, withstands double the impact and resists heat blowouts and flex breaks. *All-nylon* Universal (above) or Traction Express (left) tire bodies outwear their extra-thick treads, can still be recapped over and over! No wonder B. F. Goodrich *all-nylon* tires will give you longer service at lower cost.

Your B. F. Goodrich retailer has a complete line of *all-nylon* or rayon (smaller sizes and lower prices) tires for your mining work. Look for his address under Tires in the Yellow Pages of your phone book. See him today, or write *The B. F. Goodrich Co., Tire & Equipment Division, Akron 18, Ohio.*

Specify B. F. Goodrich tires when ordering new equipment

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

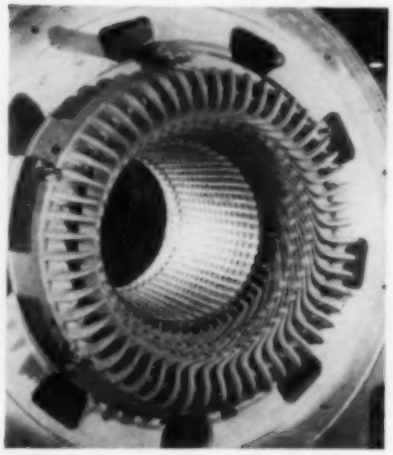
Varied Features in 1955 Truck Line

Chevrolet has introduced a fresh approach to the design of commercial cars and trucks in its completely new line of 1955 "Task Force Trucks," climaxing a 2-yr development program to produce highway carriers that would answer more closely the specialized demands of modern traffic conditions, the company reports. Offering more impressive efficiency and performance than any previous models, the line combines "a striking appearance with genuine utility," and provides 75 models on 15 wheelbases up to 220 in in the light, medium and heavy-duty fields. Some of the highspots of the 1955 models cited by the maker are: a reduction in most wheelbases of up to 8 in; wider panel bodies and a consequent gain in load space; reduction in maximum cab heights of up to 7 in on brand new "Low-Cab-Forward" models for convenience in entering and leaving the cab and easier servicing with lower hood and engine mounting; greater road-hugging qualities, with wider front treads, straight frame side-members and improved suspensions; improved cab comfort; increased safety; and tubeless tires as standard equipment for light duties. A wide range of engines is offered, five six-cylinder engines and a new V8 of 145 hp, and six choices of transmissions are available. Full details from the Chevrolet Motors Div., General Motors Corp., Detroit 2, Mich.

to 32.5 cu yd and incorporate special "traction masts" for use with the M-R-S hydraulic weight-transfer system, which shifts scraper weight forward to the tractor drive wheels when extra traction is needed. M-R-S 4-wheel tractors are available in 180- to 335-hp models, also designed for use as independent prime movers. Among features cited for the scrapers are open bowl design, stabilized balance with extra low center of gravity, true "boiling-bowl" loading, large low-pressure tires for greater flotation, simple cable reeving and full-power-forward positive pivot-tilt ejection.

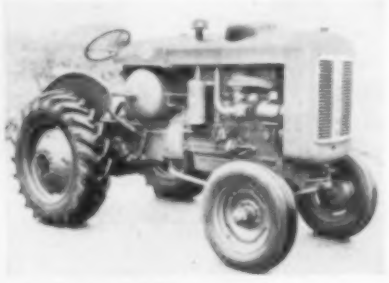
WIRE ROPE 15% STRONGER, NEW LOW-COST SLINGS

A new grade of extra-high-strength Yellow Strand "Powersteel" wire rope made of higher-carbon wire having a breaking strength 15% greater than standard Yellow Strand has been announced by Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 15, Mo. The company also has announced its new "Steeloc" wire-rope locking device that permits fabricating slings at lower cost. The new Yellow Strand Powersteel rope is recommended by the maker for tough jobs where extra strength is needed. It will withstand shock, resist wear and is a heavy-duty crush-resistant rope designed for longer service. It is always preformed and supplied with independent wire rope core. Applications include drag lines, shovel hoist ropes, rotary drilling lines, slusher ropes and scraper and dozer ropes. Slings made with the Steeloc device do not require expensive hand splicing, yet have greater strength since the ductile heat-treated steel device matches the hardness of the rope and locks into all strands, the maker reports. Steeloc can be applied to all constructions of Yellow Strand wire rope as a neat safe low-cost means of putting a loop or fitting in the end of a wire rope. Slings of rope up to 1 in can be formed with the new process and all types of fittings, attachments and handling devices can be applied with Steeloc.



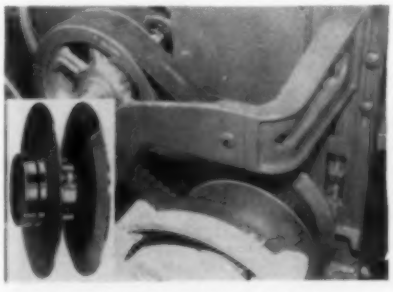
SILICONE-RUBBER INSULATION FOR LARGE MOTORS, GENERATORS

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis., has announced the first all-silicone-rubber insulating system for large motors and generators. Known as the "Silco-Flex" system, it is immediately available for all Class H insulated form wound coils and for Class A and B for certain service conditions. The development, a result of several years of test and research, marks a major step in insulation progress and is expected to change motor application practice in many industries, particularly in reducing the need for totally enclosed frame, the company says. It also brings insulation engineers closer to the goal of the "perfect" insulation—one that would never deteriorate or change in dielectric or mechanical qualities, regardless of load, during the entire life of the machine, A-C points out. The basic material is Dow-Corning's newly developed "Silastic" silicone rubber. Large machines in the 2,300 and 4,000-v insulation class with Silco-Flex insulation are being built and higher voltage windings will be available soon. Engineers expect the advantages of silicone rubber to be applied to an even wider range of motor types and ratings.



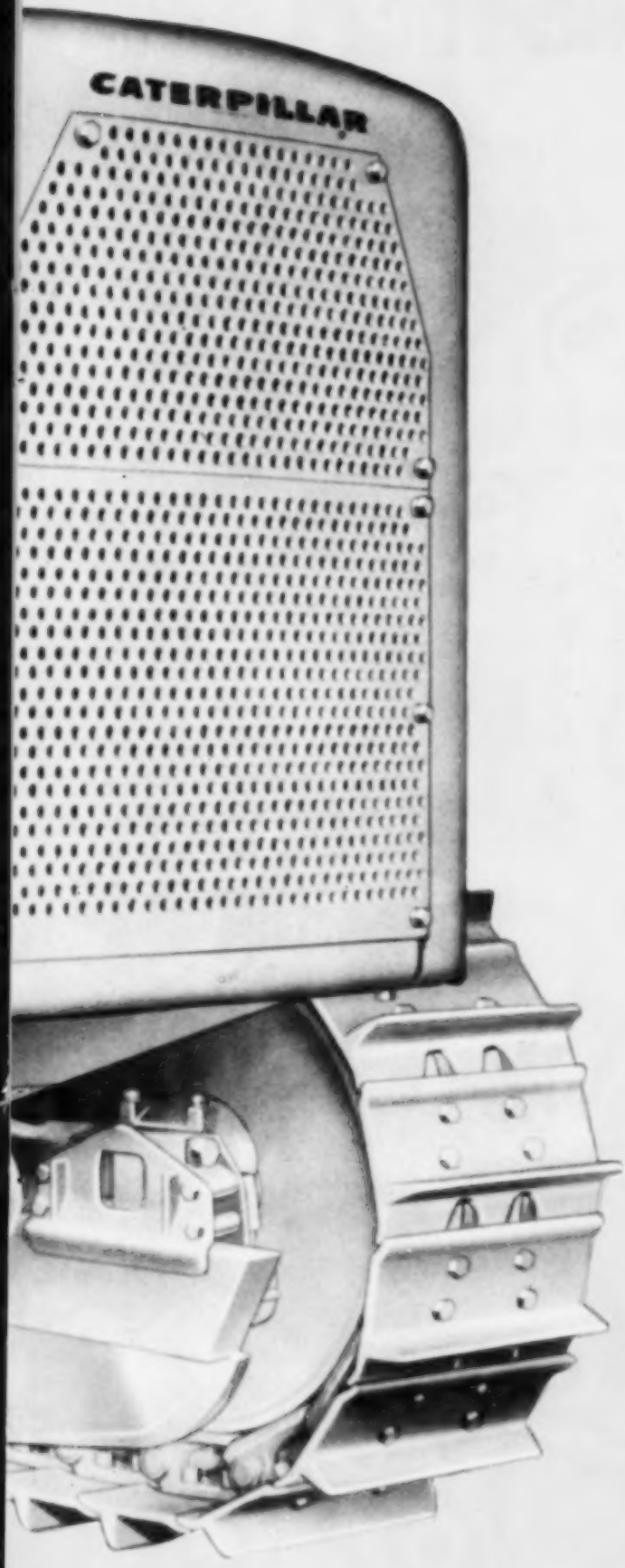
SELF-PROPELLED AIR COMPRESSOR

Schramm, Inc., West Chester, Pa., now is offering a new low-priced self-propelled air compressor known as the standard "Pneumatractor." Schramm has taken the same 125-cfm engine-compressor power plant used in its heavy Pneumatractor and "Pneumapower" portable compressor and built it into a self-propelled tractor unit that costs less than most 125-cfm two-wheel mounted portable compressors and sacrifices none of the compressor performance, the company reports. The new standard Pneumatractor will save the cost of towing or hauling, man-hours in moving about on the job, and the extra cost of a tractor on the job for pulling other equipment, it points out. Full details from Schramm.



ADJUSTABLE-SPEED DRIVES

A new single-groove wide-range Adjustable-Speed Drive available in "Q," "R" and "W" belt sections, based on recent developments said to have in-



IT'S HERE ➧

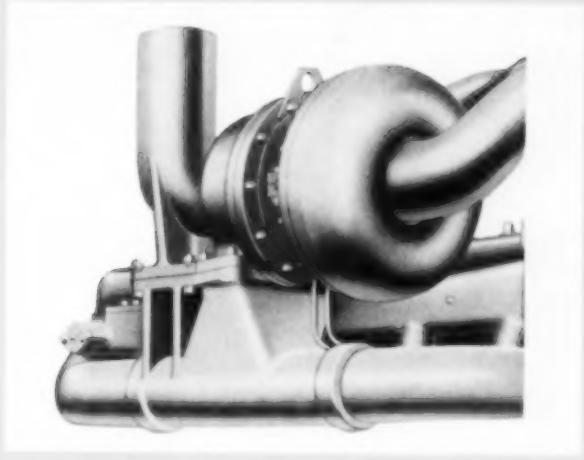
CATERPILLAR ANNOUNCES THE

D9

230 HP
(DRAWBAR)

56,200 LB.

. . . Caterpillar Leadership in Action!

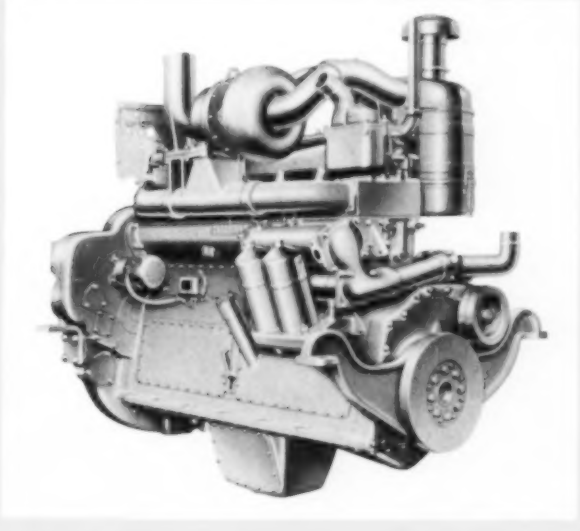


FIRST TRACK-TYPE TRACTOR WITH TURBOCHARGER!

The D9's new Turbocharger is driven by the engine exhaust, utilizing energy which would otherwise be lost. In addition, it packs air into the engine according to engine *load*, not speed. This means more working horsepower—greater performance.

CHOICE OF TORQUE CONVERTER OR DIRECT DRIVE!

Two types of drives are available, the exclusive Caterpillar oil clutch with six-speed (forward and reverse) transmission or a three-stage torque converter with 5:1 torque ratio. The transmission used with the torque converter has three speeds forward; two reverse. This option enables you to match the drive you want to your job requirements.



COMPLETELY NEW 286-HP ENGINE!

In addition to the Turbocharger, the powerful new D9 Engine features a 6¼" bore and 8" stroke and runs at 1200 r.p.m. Long life and dependability are promoted by stationary oil jet piston cooling; short, rigid valve push rods give smooth, accurate valve action; "Hi-Electro" hardened gear at the rear of the crankshaft drives timing gears and accessories; and many other advanced features.

WIDE RANGE OF OPERATING SPEEDS!

TORQUE CONVERTER:

3 speeds forward, 0 to 4.1 m.p.h., 0 to 5.7 m.p.h., 0 to 7.8 m.p.h.
2 speeds reverse, 0 to 4.1 m.p.h., 0 to 7.8 m.p.h.

DIRECT DRIVE:

6 speeds forward, 1.6, 2.1, 2.9, 3.9, 5.0, 6.8 m.p.h.
6 speeds reverse, same.

CONSTANT-POWER DRIVE FOR REAR-MOUNTED EQUIPMENT!

You always have power for cable controls, direct from the engine's rear power take-off. This makes cable control operation completely independent of flywheel clutch or torque converter and gives you a big boost in operating efficiency.

The D9...
proven in the field for a year!

Though new, the D9 is already a veteran. After exhaustive proving-ground tests, several D9s have been tested for over 19,128 hours on the toughest jobs in logging, construction, mining and quarry work. These jobs tested every square inch of this mighty new machine. The word from the field: "By far the best big tractor ever made."

Rugged—
and easy to service!

From its one-piece welded steering clutch case-frame assembly, to its track shoes hardened by the "Water Quench" process, the D9 is the toughest crawler built. And it's designed for easy servicing. Oil clutch, torque converter, transmission case and steering clutches can each be removed individually without disturbing other components. Hydraulic track adjusters are among the many other features for fast, easy adjustment and service work.

Brief specifications

Length: 17' 10¾"
Width: 9' 11¼"
Height: 8' 9"
Gauge: 90"
Weight: 54,000 lb. approx., dry
56,200 lb. approx., operating

Easy to operate!

- The independent "live-shaft" drive for cable controls makes operation smoother, easier.
- Hydraulic boosters provide both power steering *and* power braking.
- Adjustable seat, all-around visibility, easy access to all controls make operator's job simpler.
- Important new 7-roller track frame improves stability, flotation and ride.
- New starting engine has electric starting system and simple single-lever control for easy operation from the seat and insures fast starts in all weather.

Equipment

New CAT*-built 'Dozers for the D9: the No. 9S Bulldozer, modified straight blade; the No. 9A Bulldozer, angling blade.

New Cat-built Cable Controls: the No. 29 rear-mounted, double drum; the No. 30 front-mounted, single drum.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

MAIL TODAY!
CATERPILLAR TRACTOR CO., Peoria, Illinois, U. S. A.
I'd like more information on the D9.
*Name*_____
*Company*_____
*Address*_____
*City*_____ *Zone*_____ *State*_____

CATERPILLAR*
*Both Cat and Caterpillar are registered trademarks — ®

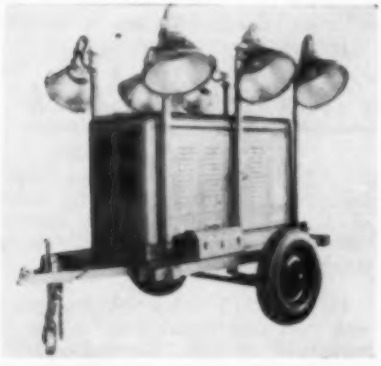
THE D9... NEW KING OF THE CRAWLERS

PRINTED IN U. S. A.

creased capacities of this type of drive up to a maximum of 30 hp, is available from the American Pulley Co., 4200 Wissahickon Ave., Philadelphia 29, Pa. The drive permits a speed variation of as much as 100% at horsepower capacities comparable to the former drives having two or three belts, and provides a considerable saving of space and money as compared with multi-V-belt adjustable-speed drives, the manufacturer reports. A complete engineering catalog on the line is available from American Pulley.

SELF-PROPELLED UNIT

A self-propelled, one-man operated, rubber-tired utility crane, said to work equally well with crane, clamshell, dragline, lifting magnet, shovel or hoe attachments and to travel from job to job at speeds of up to 7 mph, has been introduced by Link-Belt Speeder Corp., Cedar Rapids, Ia. The new UC-68 is specially designed for mobile plant work as well as stockpiling, construction and erection operations. Like all Link-Belt machines, the UC-68 features "Speed-o-Matic—the true power hydraulic control system," said to offer easy, fast, accurate and safe handling and spotting of loads and greater output with less operator fatigue and effort. On production jobs, this advantage has resulted in output increases ranging up to 25% or more, the company says. Bulletin 2566 gives details.



LIGHTING FOR NIGHT WORK

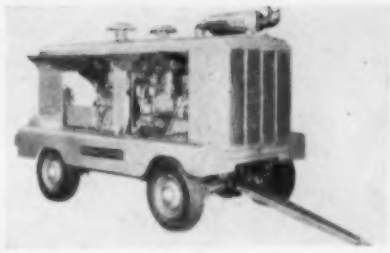
A complete trailer-mounted lighting unit, announced by the United States Motor Corp., Oshkosh, Wis., is powered by a 10-kw U. S. engine-generator. A series of six 1,500-w lights with full swivel and vertical adjustment supplies the broadest illumination possible for strip mining or general construction work, it is said. The panel board permits individual control of the lights and includes receptacle outlets for the operation of power tools. Lights may be removed and spotted at various positions and distances from the generator. A wide variety of engine and generator sizes for lighting and power are available on special order.

CAR SHAKER SPEEDS UNLOADING

Its new car shaker reduces the unloading time of drop-bottom gondola cars to one man's effort and a few minutes work, reports the Simplicity Engineering Co., Durand, Mich. The new unit, 11 ft 1 in long, 4 ft high and 5 ft wide, is designed to fit any size gondola; features heavy all-welded stress-relieved construction; and weighs 9500 lb. The motor is enclosed in the unit and mounted on resilient rubber to reduce vibration. The new car shaker features a two-bearing single-shaft gyrating assembly which transmits vibration to the car for rapid discharge of granular materials even when frozen. It is balanced for easy handling by an overhead crane or hoist.

NEW-DESIGN ROCK BITS

Designed for use on the new, larger machines, Brunner & Lay offers X-type tungsten-carbide "Rok-Bits" in 3½-, 4- and 4½-in-gage sizes to fit on 1½- and 2-in drill rods. X-type Rok-Bits are now made to fit directly on the steel of two machines, eliminating the use of expensive adapters, and feature a new body design and new job-fitted carbides, the manufacturer points out. Bulletin B-1 available from Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill.



600-CFM PORTABLE COMPRESSOR

An all-new 600-cfm rotary portable air compressor, said to combine the basic rotary advantages of compactness, light weight and simplicity with the weather-defying advantages of water cooling, has been announced by Gardner-Denver Co., Quincy, Ill. The new water-cooled rotary G-D "Rotary 600" compressor, features of which are said to be exclusive with the Gardner-Denver design, is reported to provide reliable operation under severe weather conditions ranging from 40 F below zero to 115 above. The unit is equipped with a simple automatic speed control, the G-D "Thriftmeter," which is said to save fuel and wear and tear on the engine and compressor because it keeps operating speed of the unit in line with air demands. Automotive-type running gear provides a short turning radius of 14 ft and the compressor is powered by a General Motors 6-71 diesel engine, with electric starting system furnished. Details from company.

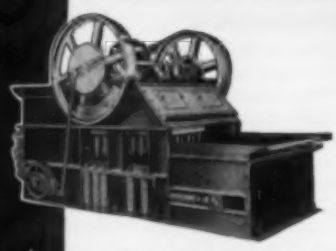
VARIED TRUCK LINE OFFERS 92 MODELS, 32 ENGINES

Thirteen new International six-wheel motor truck models, with GVW ratings from 33,000 to 41,000 lb, have been introduced by the motor-truck division of International Harvester Co., 180 N. Michigan Ave., Chicago 1. The latest additions to the company's line include trucks of both conventional and cab-over-engine design and bring to 92 the number of tandem-drive units offered by Harvester. In addition, International has reported the introduction of two new engines, making a total of 32 power plants available for its R-Line trucks. The new trucks include: Model RF-178, rated at 33,000 lb GVW; four RF-200 Series trucks, 37,000 to 41,000 lb; four cab-over-engine COF-190 models, 30,000 to 35,000 lb; and four COF-200 Series six-wheelers with GVW ratings from 37,000 to 41,000 lb. The RF-200, COF-190 and COF-200 Series each include a Roadliner tractor model with gross combination weight ratings of 65,000, 55,000 and 65,000 lb, respectively. Each of the new models incorporates International's performance-proved bogie design and precision-matched components for smooth and economical performance, the company states.

Designed to deliver exactly the right power for the job and representing the most extensive range of engines offered by a motor truck manufacturer, according to International, engines now avail-

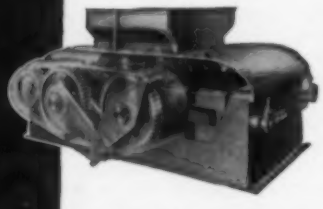
America's most complete line of CRUSHING EQUIPMENT

AVAILABLE FROM STOCK AND ON SHORT NOTICE



McNally Norton Vertical Pick Breaker

50% less fines when reducing lump to egg and stove sizes.



McNally Double Roll Gearmatic R. O. M. Breaker

Built in tonnage ranges from 750 tph to 1400 tph. Full floating Gearmatic drive.

McNally Gearmatic Stoker Coal Crusher

This unit offers three prime advantages: High volume production, plus accurate sizing, plus low percentage of fines.

McNally Single Roll Crusher

Universal application. 20", 24" and 36" dia. rolls.

For immediate action on complete information write, wire or call . . .

Mc

★ Pittsburg, Kansas ★
★ Wellston, Ohio ★

able for International R-line trucks include 13 gasoline units ranging from 108 to 318 hp; 10 diesel engines rated from 135 to 300 hp; and nine engines with LPG fuel systems ranging up to 356 hp. Eight LPG-powered engines (Underwriters Laboratories listed) are available as optional equipment for models throughout the 4,200 to 65,000 GVW range.

Diesel engines, in 135- and 150-hp ratings, are optional in heavy-duty International trucks in the 22,000- to 41,000-lb GVW classification. For extra heavy-duty models built at International's Emeryville, Calif., works, larger gasoline, LPG and diesel engines are available. These giant models ranging up to 90,000 lb GVW are powered by diesel engines from 165 to 300 hp, gasoline engines from 267 to 318 hp, or LPG engines from 305 to 356 hp. One of two new International-built engines is the 140-hp Black Diamond 264, a high-torque valve-in-head unit said to provide exceptional power output and fuel economy. The other, the Royal Red Diamond 501, is a high-torque engine that develops 212 hp. Full details from International.

NEW LINE OF AXLES FOR OFF-THE-ROAD EQUIPMENT

For application in heavy-duty four-wheel-drive equipment, such as, graders, scrapers and other off-the-road vehicles, a new line of planetary drive and drive-steer axles is available from the Axle Div., Clark Equipment Co., 482 Second St., Benton Harbor, Mich. The drive-steer axle is now being produced in capacities of 11,000, 17,000 and 20,000 lb, with a companion line of drive axles available in capacities of 16,000, 17,000, 24,000 and 30,000 lb. By replacing the conventional differential carrier with a through-drive type, the smaller axles in this line can be converted into tandem units. Advantages of using planetary-type drives at the wheel end of the axles cited by the company include putting the final power multiplication as close as possible to the point of application; a substantial size reduction in the steering joint, axle shafts and differential without any sacrifice in structural strength; elimination of torsional wind-up in the drive shaft and surging in the vehicle; added operational safety because of the low torque load on differential, ring gear, pinion and drive shaft; accessibility of secondary reduction assembly for maintenance; and ease of maintenance because of lighter construction.

DIESEL POWER UNIT

A new 125-hp, 1,200-rpm, 4-cylinder, four-cycle, valve-in-head D339 diesel engine has been introduced by Caterpillar Tractor Co., Peoria, Ill. The new unit, with a 5¾-in bore and 8-in stroke, replaces the discontinued D8800 line. The D339 offers 25% more horsepower and operates at 200 more rpm than the D8800, and also offers many engineering advancements for better all-around performance, greater compactness, neater appearance and easier service, the company reports. One of the key new D339 features cited by the maker is an engine balancer which permits the 4-cylinder engine to operate at 1,200 rpm with the same degree of smoothness as a 6-cylinder design. Designed for various industrial installations, the engine is offered with a choice of three different starting systems: air, direct electric and gasoline engine, with electric starting for the gasoline starting engine also available.

NEW AC MOTOR LINE

A completely new line of industrial AC electric motors built to the new NEMA standards is available from the Lima Electric Motor Co., 192 Findlay Rd., Lima, Ohio. Among the features cited by the company are better protection from moisture and abrasive dusts; double-end ventilation provided by dual cast-aluminum fans; greater horsepower in a smaller package with reduced unit weight; increased service-free life. Currently, all standard ratings are available in frame sizes 182, 184, 213 and 215, with the balance of the line up to 30 hp to feature the new design.

Equipment Shorts You'll Want to Check

FOR VEGETATION CONTROL around plants and other industrial areas, Dow Chemical Co., Midland, Mich., offers "Baron," a nonselective herbicide using a new chemical weed killer said to be highly effective against almost all perennial grasses and herbaceous plants on which it has been tested. Baron may be sprayed on soil, acting as a residual sterilant for about a season; or directly on leaves to kill most plant species. Full details from Dow Chemical.

NEW BUCKET for its 4-wheel-drive 1-cu yd TL-12 "Tracto-Loader" has as much as 25 deg of tip-back at ground level, providing easier and faster loading and handling of larger loads, according to the Tractomotive Corp., Deerfield, Ill. Bucket's ability to retain heaped loads permits a practical carrying height of 3 ft, resulting in better operator vision and greater balance and stability, the company says.

PIPE-JOINTS with a tighter pressure-seal than ever before possible can be made with its new "Liqui-Moly High-Pressure Silicone Thread Compound," reports the Lockrey Co., Southampton, N. Y. Compound reduces friction so that fitting can be run two or three turns past end of thread, cutting unthreaded metal to provide a tight metal-to-metal seal, it says. Bulletin 26-A with details from Lockrey.

TWO NEW HEADSHIELDS for welding operators announced by Hobart

. . . again chosen by
CHICAGO, WILMINGTON & FRANKLIN COAL COMPANY

From 1942 to 1950, King Koal conveyor belting played an important part in C. W. & F.'s continuing program to reduce their costs of underground mining.

Based on the satisfactory results of these first eight years, in 1950, C. W. & F. again specified Hamilton's King Koal for use in their Orient Mine #3 in keeping with their policy to make this new mine produce coal at the lowest possible cost per ton.

Since 1950 additional King Koal was purchased to extend the underground belt system. Early in 1954, further development of the Orient Mine #3 required still another 10,000 feet of King Koal.

VISIT OUR EXHIBIT
Booth 2504
THE AMERICAN MINING CONGRESS
May 16-19, 1955
Cleveland, Ohio

Yes, once more, King Koal underground conveyer belting has proven its outstanding advantages of low stretch strength, better troughing and training and high resistance to moisture and damp rot . . . features that are offered to you at no premium cost for quality.

MORE THAN THREE QUARTERS OF A CENTURY OF SERVICE TO INDUSTRY

Be sure . . . use Hamilton . . . Always dependable!

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MANUFACTURING CORPORATION

Executive Office and Factories, 102 Meade St., Trenton, N. J.

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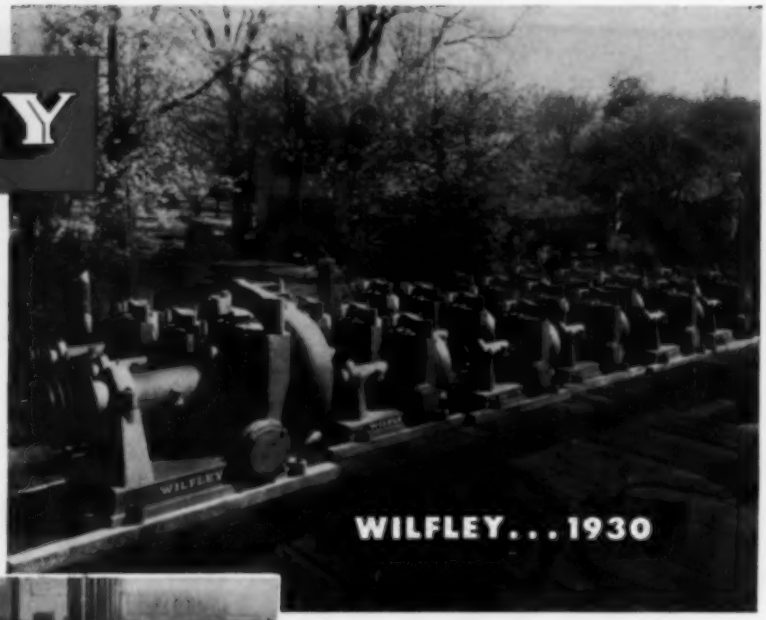
WILFLEY

...Advances with the Mineral Industry



Progress in Low-Cost Pumping

Top photo (right) shows part of a large shipment of Wilfley Model "C" Sand Pumps ready for delivery to a large nickel producer.

25 years later this same company still depends on Wilfley for low-cost pumping. Shown in bottom photo is part of a large shipment of Wilfley's new Model "K" pumps on their way to the same customer.

The name Wilfley means continued progress in efficient, economical pumping. Wilfley keeps pace with mineral production throughout the world by designing and manufacturing pumps that definitely deliver cost-saving performance on every application.

Write or wire for complete details on Wilfley Pumps

Wilfley Acid Pump
"COMPANIONS IN ECONOMICAL OPERATION"
Wilfley Sand Pump

A. R. WILFLEY and SONS, INC. Denver, Colorado, U. S. A.
New York Office: 1775 Broadway, New York City

Bros., Troy, Ohio, are molded of fiberglass reinforced plastic, offering user lighter weight comfort with complete head protection. Type 971 has lens holder molded right into shield; Type 973 a lift-front lens holder.

FOR PARKING LOTS, company roadways, etc., newly developed "Veon" plastic traffic-marking compound dries within 30 sec of application, outlasts paint by 5 to 1, and is more economical than either paint or inlaid marking discs, the maker says. Full data from Broadway Maintenance Co., Long Island City, L. I., N. Y.

LOUD HIGH-FREQUENCY NOISES are screened out but voices are audible to wearers of AO "Straightaway Sound Protectors," a new type of device for preventing harmful effects of constant exposure to noise. They are said by the maker to be more effective, sanitary and comfortable than earplug-type protectors. Details from the American Optical Co., Southbridge, Mass.

CRANE ATTACHMENT with a forged steel hook and double tilt cylinders now is available for all models of its Michigan tractor-shovels, reports the Clark Equipment Co., Benton Harbor, Mich. Boom lengths vary from 3 to 4½ ft, with load capacities ranging from 4,000 to 7,000 lb. Four pins are removed to replace the bucket with crane and no hydraulic connections are broken.

LOW HYDROGEN ELECTRODE, with powdered metal added to the coating, is called "Strikeasy LH-1" by the General Electric Co., Schenectady 5, N. Y. It provides faster and easier operation than conventional low-hydrogen electrodes, with excellent X-ray properties of weldments, G-E reports. Spatter is low and slag removal is much easier than with conventional types, it also points out.

MOBILE STORAGE SYSTEM can increase present cabinet or shelving capacity by 30 to 70% without additional floor space, by eliminating useless aisles while utilizing existing equipment, according to Dolin Metal Products, Inc., 315-56 Lexington Ave., Brooklyn 16, N. Y. Storage units are placed on easily moved heavy steel bases traveling on tracks, with two slightly shorter mobilized rows of units placed in front of one fixed row. Full details from the maker.

FREE BULLETINS AVAILABLE

CONTROL DEVICES—New 68-p catalog of general purpose control devices, featuring a special section on selection of motor control, is offered by the General Electric Co., General Purpose Control Dept., Schenectady 5, N. Y. Designated GEC-1260A, the catalog contains photos, book prices, wiring diagrams and dimensions on motor starters, contactors, relays, solenoids, switches, push buttons and pilot devices. Also included is information comparing applications and merits of manual and magnetic control, and across-the-line and reduced-voltage control. The special section on control selection shows by enclosure, type and rating the exact components of motor control systems for each horsepower rating.

STATIONARY BATTERIES — New specification bulletins, CP-536-Rev. 1 and CP-537-Rev. 1, cover C&D's complete line of lead-calcium and lead-antimony batteries for control, switchgear and auxiliary power application. Included are data on battery ratings and capacities, details of design and construction, dimensions, weights and types of containers. C&D Batteries, Inc., Conshohocken, Pa.

SCRAPERS—The Caterpillar Tractor Co., Peoria, Ill., offers a new 8-p Booklet DE528, which depicts the company's complete line of scrapers. Entitled "Caterpillar Scrapers . . . Because," the heavily-illustrated booklet shows different-sized "Cat scrapers" working on various construction jobs throughout the world. The booklet stresses bigger loads, faster round trips, stability for speed, controlled ejection and high apron lift, and covers various newly improved scrapers in the Caterpillar line.

MATERIALS TREATMENT — New bulletin 7502, available from Dorr-Oliver, Inc., Barry Place, Stamford, Conn., describes the operation, advantages, theory, background and typical applications of "FluoSolids" systems for drying, sizing or heat treatment. The bulletin cites operating data from two drying and dedusting installations.

TRUCK MAINTENANCE — A new preventive maintenance chart for conventional five-speed transmissions is available from the Fuller Mfg. Co., Kalamazoo, Mich. The special chart was developed specifically for truck owners, maintenance men and operators. It covers every check point for conventional five-speed transmissions, from the hand brake lever assembly to splines on the output shaft.

AC MOTORS—New 28-p Catalog GEC-1026, available from the General Electric Co., Schenectady 5, N. Y., presents complete buying information on standard AC fractional and integral horsepower motors in most general use. Among those described are general- and definite-purpose fractional horsepower motors, and fhp gear motors. Information on all motors includes photos, ratings, book prices, dimensions, weights, frame numbers and standard modifications.

COMPRESSORS—New 12-p Catalog CG-9A, issued by Le Roi Div., Westinghouse Air Brake Co., 1706 S. 68 St,. Milwaukee 14, pictures 40 models of available portable-type compressors. The quick reference chart shows capacities, engine types and mountings available. Features illustrated include: replaceable cylinder sleeves, interchangeable valve parts, aircraft-type compressor

Super Scale for Conveyors
Builders Conveyoflo is unsurpassed for accurate weight-metering of belt conveyor flows. Pneumatic system gives full-range metering with minimum vertical belt deflexion. Compact — no overhead framework or complicated lever arms. For Bulletin 550-H4A, write Builders-Providence, Inc., 395 Harris Avenue, Providence 1, Rhode Island.
BUILDERS-PROVIDENCE
DIVISION OF B-I-F INDUSTRIES, INC.
METERS
FEEDERS
CONTROLS

CUT SHUTTLE CAR MAINTENANCE COSTS!

the Lee-Norse DRIVE WHEEL FRICTION

FOR 5SC OR 6SC SHUTTLE CARS

- ELIMINATES DIFFERENTIALS
- ABSORBS ROAD SHOCKS
- PROTECTS ALL DRIVE PARTS

DESIGNED TO SAVE YOU MONEY in unnecessary repair bills, the LEE-NORSE DRIVE WHEEL FRICTION gives you valuable protection where you need it most . . . all drive parts are protected from destructive loads.

PREVENTS DAMAGE. A new principle of operation prevents damage to the drive by limiting the torque that can be delivered to each wheel within the safe operating range of its driving parts. Destructive road shock is absorbed by the adjustable spring-loaded multiple disc friction. In operation the shuttle car has four-wheel drive with independent wheel action at all times—**without** a differential. The differential may be completely eliminated.

EASY TO INSTALL. The present drive flange and shaft are removed from each wheel and the drive wheel friction is simply bolted in their place. Conversion is quick . . . easy . . . inexpensive.

GUARANTEE

Try the LEE-NORSE DRIVE WHEEL FRICTION on your shuttle cars for ninety days. If not satisfied at the end of this trial period your money will be refunded.

Lee-Norse Company

Specialists in Coal Mining Equipment

CHARLEROI, PA.

Write today for complete information.

cylinders, heavy-duty industrial-type engines, and magneto ignition on all gasoline models.

POWER TRANSMISSION — New Catalog PV-200, illustrating and describing the new Browning "Poly-V Drive" is offered by the Browning Mfg. Co., Maysville, Ky. Multiple V-drive moulded as a single unit running on matching sheaves is said to combine the advantages of V-belts with the simplicity of flat belts. The catalog contains specifications on hundreds of sizes of stock sheaves and belts, complete engineering data for drive design, and tables of practical stock-drive combinations already worked out for convenient selection.

PUMPS—New 24-p Motorpump Bulletin 7093-E, released by Ingersoll-Rand, 11 Broadway, New York 4, covers its entire line of close-coupled Motorpumps from ¼- to 75-hp sizes for delivery of 5 to 2,800 gpm. The bulletin is designed to make it easy to select the correct size and model, and also provides tables of dimensions, weights, performances and mountings. A typical pumping problem is given with its solution, plus pipe friction tables.

TRACTOR-SHOVELS—Design, construction, operation and correct application of 1-cu yd Michigan "75" tractor shovels are described and illustrated in new 12-p Catalog 7500-P offered by Clark Equipment Co., Construction Machinery Div., Benton Harbor, Mich. Models for application on all job conditions are described, including an all-wheel drive, a front-wheel drive and a rear-wheel drive. Optional attachments show the numerous jobs that can be done with a rubber-tired tractor shovel.

V-BELT DRIVES—Engineering Guide 50-B enables quick and accurate "V-Drive" selection, using new horsepower rating and improved rating techniques adopted by Multi-V-Belt Drive and Rubber Manufacturers' associations. Simplified formulas for standard quarterturn and V-flat drives are augmented by tables of drives in all belt sections. Fort Worth Steel & Machinery Co., P. O. Box 1038, Fort Worth, Texas.

DIESEL ENGINES — Ingersoll-Rand has released a new 20-p bulletin describing features of its Type "S" and "SS" heavy-duty diesel engines in sizes from 375 to 1,000 hp. Full design and operating data are given, along with specifications and dimensions, and details of engines and component parts. Form 10,040 from Ingersoll-Rand, 11 Broadway, New York 4, N. Y.

TWIN DIAPHRAGM PUMP — Rice Pump & Machine Co., Belgium, Wis., in new Bulletin 55DP, emphasizes the construction of a new 4-in diaphragm pump which combines two single units to double the conventional pumping capacity. The same ratings applied to the single valve types carry over to the new line of double pumps which now deliver up to 12,000 gpm at 10 ft suction lift. The 12,000-gpm unit is mounted on a truck for towing.

"EUCS" are PACE-SETTERS for PROFITS

See the latest models with many new cost-cutting features at the Coal Show in Cleveland. You won't want to miss the big Euclid exhibit in space 1629!

For coal stripping operations Euclid Rear-Dumps and Bottom-Dumps rate high in keeping overburden and coal hauling costs low. Their ability to stay on the job month after month, with less down time for servicing and repairs, has made "Eucs" the first choice of leading mine operators. Have your nearby Euclid dealer make a production and cost estimate for your operation . . . there's no cost or obligation, and there's a good chance that he can show you how to cut your hauling costs.

• Rear-Dump Euclids, of 10, 15, 22, 34 and 50 ton capacities, are powered by diesel engines of 125 to 600 h. p. With standard 5 or 10 speed transmission, or with Torqmatic Drive, they have a range of travel speeds up to 36 m. p. h. with full payload. These "Eucs" are unequalled for performance and low operating cost on the toughest jobs. No matter what your off-the-highway hauling requirements may be, there's a Euclid model that can haul more loads per hour at lower cost per ton or yard moved.

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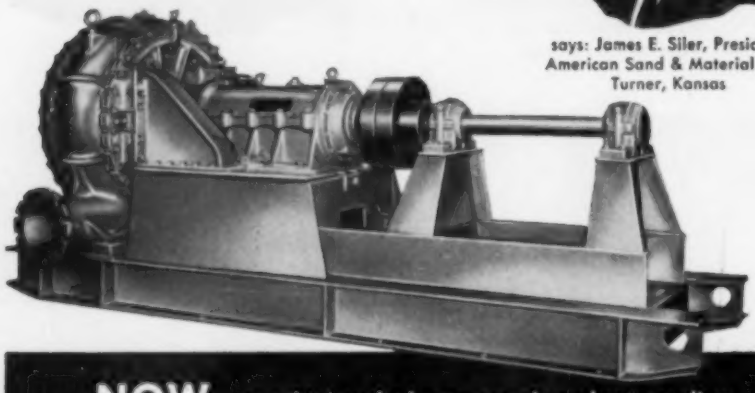

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WATER SOFTENERS — Troubles caused by the utilization of hard water and the multiple economies effected by curing them are thoroughly discussed in 20-p Bulletin 2386-A released by The Permutit Co., 330 W. 42nd St., New York 36. Specifications, operating characteristics and typical installation are included.

TURBINE PUMPS—Bulletin 107, a 12-p pamphlet offered by Roy E. Roth Co., Rock Island, Ill., describes 19 models of two-stage regenerative turbine pumps. The pamphlet illustrates the operating principle and provides data on mechanical seals available, installation dimensions and performance tables for pumps handling both cold and hot water.

INDUSTRIAL INSTRUMENTS—Catalog 5002 is a new issue of the composite catalog which briefly and concisely describes Honeywell industrial instruments and equipment, including the latest developments. It is available from Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Windrim Aves., Philadelphia 44.

THREAD REPAIR—Literature on the new "Shop-Pack" for thread repair is offered by the Heli-Coil Corp., Danbury, Conn. Bulletin 724 illustrates the three-step operation of making permanent thread repairs in steel, cast iron, aluminum, magnesium, copper, plastics or wood.

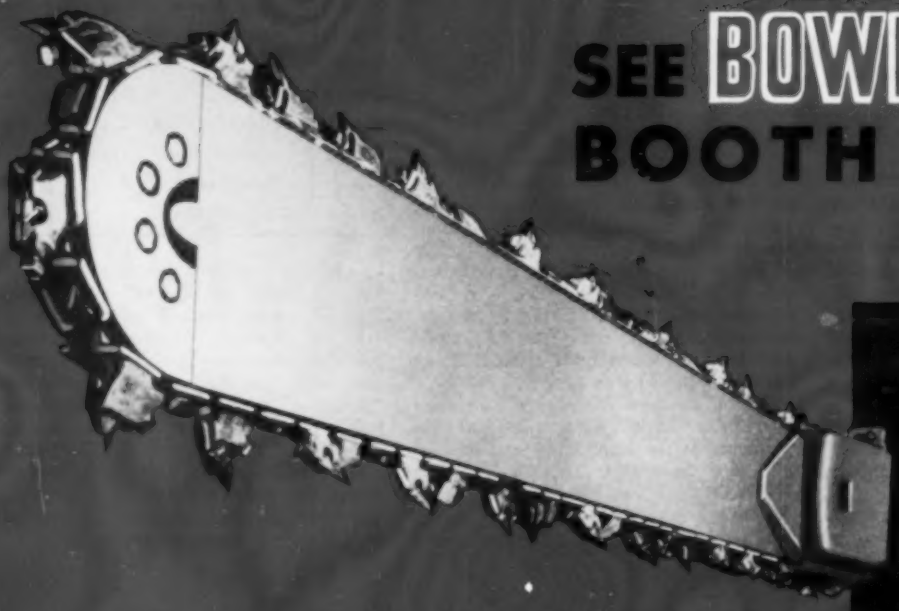
FILE REORGANIZATION—"Subject File," a new folder by Remington Rand, tells how business and industry can secure worthwhile annual savings and increased efficiency through records analysis and file reorganization by the company's Business Services Dept. file organizers. Bulletin BSD 32 from Remington Rand Inc., 315 Fourth Ave., New York 10.

BRAZING—The Air Reduction Sales Co., 60 E. 42nd St., New York 17, offers a new 24-p brazing manual describing application of major brazing methods in joining metals using silver alloys and filler metals, fluxes and gas atmospheres. Subjects discussed include silver-brazing procedure, selection of brazing and filler metals, design of brazed joints, prebraze cleaning, assembly of brazed joints, and many others.

STEEL SHELVING—"Klip-Bilt," the new boltless steel shelving erected at low cost without use of tools of any kind, is described in Catalog 701 from The Frick-Gallagher Mfg. Co., Wellston, Ohio. Several types of high-strength shelf construction designed to accommodate varying shelf loads from average to extra heavy are depicted.

MACHINERY MOUNTS—New Bulletin 546, available from Barry Controls, Inc., 1000 Pleasant St., Watertown, Mass., shows how mounting machinery pays off in higher production output and lower production costs, less down time for maintenance, and reduced installation costs. Also given is a summary of the types of Barrymounts which have been engineered for applications on various machines.

coal cutting costs make you see Red ?



SEE BOWDIL* . . . BOOTH 1006

▲ West Kentucky Coal Company, Madisonville, Kentucky, cuts costs in their East Diamond Mine with this mobile cutting machine using Bowdil 9-ft. Cutter Bar, Bowdil Chain and new 1-29 Bowdil Bits.

PHOTO BY WM. VANDIVERT FOR WEST KENTUCKY COAL COMPANY IN COOPERATION WITH BITUMINOUS COAL INSTITUTE.

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NEWS ROUND-UP

Industry Continues Drive For Foreign-Oil Quotas

THE COAL INDUSTRY'S CASE for protection from excessive residual oil imports has been "authenticated and endorsed" by the President's Cabinet Committee and now must be implemented by Congress, Tom Pickett, executive vice president, National Coal Association, told the Senate Labor Subcommittee studying the causes of unemployment in the United States April 15. Mr. Pickett appeared on the concluding day of 6 wk of hearings during which the subcommittee heard over 50 witnesses representing coal and other industries describe the damaging effects of foreign trade on the U. S. economy. Chairman of the subcommittee is Sen. Matthew M. Neely (D., W. Va.), and the other members are Sen. Herbert H. Lehman (D., N. Y.) and Sen. George E. Bender (R., Ohio).

In his prepared testimony, Mr. Pickett reported employment losses in the coal and railroad industries resulting from foreign oil's invasion of fuel markets on the East Coast and quoted the Cabinet Committee's report to substantiate the coal industry's warnings that unrestricted oil imports are inimical to the domestic economy and security. Later, in commenting on a State Department unsigned and undated memorandum attacking the bill for quota limitations on oil imports, Mr. Pickett declared that the global philosophy of the State Department has so permeated U. S. foreign trade policies that "the international tail is wagging the domestic dog." The "surreptitious memorandum" which was issued to key government and Congressional officials "is an affront to the United States Congress" and "reflects on the integrity of scores of witnesses" before the committee, Mr. Pickett said.

The State Department's position was outlined April 19 in a special paper it released to reporters asking for it. It listed 10 reasons for its opposition to the restriction of oil imports, maintaining that such action would be "contrary to the national interest." There is "little or no evidence," the paper said, that either the domestic crude oil industry or the coal industry have "so suffered from imports" as to justify departure from principles of free enterprise and competition to solve the situation.

Appearing before the subcommittee April 14, Sen. Harley M. Kilgore (D., W. Va.) declared that excessive residual oil imports are chiefly responsible for unemployment in West Virginia and other coal areas, and that the national safety is imperiled as a consequence of the present status of the coal industry. He hit at "the very men who supposedly prepared" the Cabinet Committee's report calling for quota restrictions and than appeared on Capitol Hill in opposition to such a proposal.

There are now 200,000 unemployed coal miners with nearly 700,000 dependents in the bituminous and anthracite coal industries, Thomas Kennedy, UMWA vice president, told the subcommittee April 15. Mr. Kennedy called for a national fuels policy to bring equality of market opportunity for coal and said that the federal government should restrict residual oil imports to 10% of domestic production, act to lower discriminatory freight rates against coal and halt the wasteful, cut-throat "dumping" practices of the natural gas industry. The unemployment figures were based on a survey of 27 UMWA district in 20 states, which also showed there are only 180,650 men now in the two industries, working an average of 3.2 days a week, he reported.

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New Books For Coal Men ..... p 190

USBM Director Urges Greater Effort, Citing 1955 Fatality Increase

FEDERAL coal mine inspectors last month were urged by J. J. Forbes, USBM director, to give "greater and better directed efforts" to the promotion of mine safety. In a letter to all mine inspection personnel dated April 1, Mr. Forbes pointed out that Congress "rightfully expects favorable results" from operation of the Federal Coal Mine Safety Act and cited increases in the fatality rates for 1954 and the first 2 mo of 1955 as "cause for general alarm and for a re-evaluation of our individual and collective efforts."

In his letter, Mr. Forbes said:

"As you can see, the coal-mining industry is off to a very, very bad start in 1955—insofar as coal mine fatalities are concerned. We were considerably concerned to learn, early in January, that the fatality rate for 1954 had leaped to 1.01 from 0.84 in 1953, but a further increase

ALL FATALITIES

Period	Bituminous		Anthracite		Total	
	Fatals	Rate[2]	Fatals	Rate[2]	Fatals	Rate[2]
1953	396	0.84	64	0.91	460	0.84
1954	333	0.98	62	1.20	395	1.01
1955 (February)	40	1.32	7	1.52	47	1.35
1954 (Jan.-Feb.)	56	0.93	15	1.39	71	1.00
1955 (Jan.-Feb.)	73	1.19	12	1.32	85	1.20

[1]1953 and 1954 data subject to revision.

[2]Fatalities per million man-hours exposure.

ROOF-FALL FATALITIES

Jan.-Feb., 1954	31	10	41
Jan.-Feb., 1955	35	9	44

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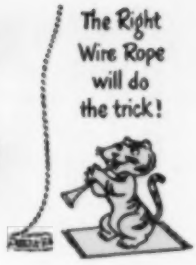

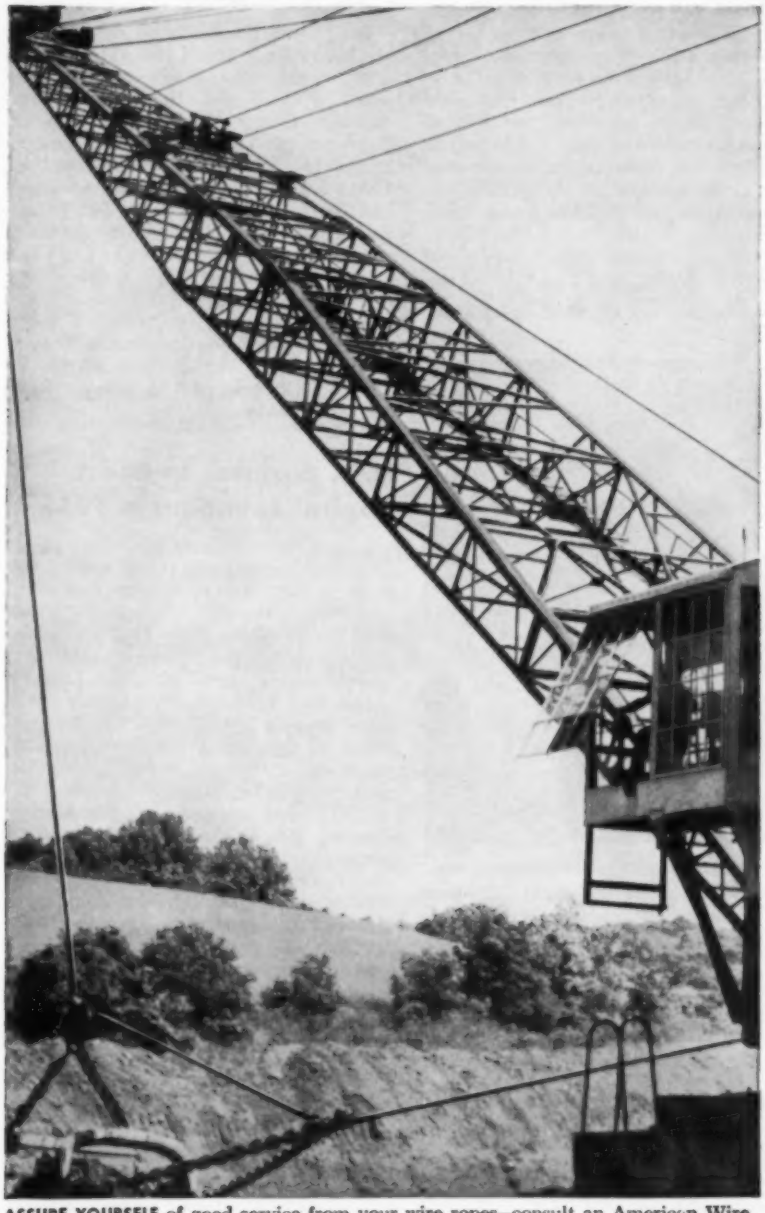

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FORBES URGES MORE EFFORT .

to 1.20 for the first 2 mo of 1955 is cause for general alarm and for a re-evaluation of our individual and collective efforts.

"I'm sure it is generally understood that each of us, who has to do with operations under the Federal Coal Mine Safety Act, both Title I and Title II, must assume his share of the responsibility for reducing the number of accidents in coal mines. The Congress, in providing funds for our operations under the Act, rightfully expects favorable results, and we simply must exert enough honest and sincere effort to do the job that is expected of us.

"If anyone has been 'coasting' with the idea in mind that we can relax for awhile and 'let Joe do it,' he needs but to look at the record to realize that we dare not let up for one minute; that we must constantly strive to improve our methods of reducing coal mine accidents. It is likely that some of the conditions that are causing accidents to increase are the result of poor quality maintenance, lack of suitable supplies, and 'corner cutting' brought about by the present economic situation in the industry; this must be overcome as much as possible through greater and better directed efforts on your part and our part.

"I feel that many of you, through your broad experience under varied mining conditions and because of a special aptitude for devising ways and means of improving safety conditions and practices, may have some new ideas as to how our safety efforts can be better directed, about improved methods of supporting mine roof, etc. I urge you to submit to this office any ideas you may have along this line, so appropriate follow-up action can be taken on a nation-wide basis.

"Let's get our shoulders to the wheel now, push harder, and give a better account of ourselves."

Wide World

CONFIDENCE IN THE FUTURE EXPANSION of the anthracite industry was expressed by Francis O. Case, president, Glen Alden Coal Co. (left); Thomas Kennedy, vice president, UMWA; and John P. Robin, Pennsylvania Secretary of Commerce. They were the principal speakers at the First Annual Interstate Solid Fuel Conference attended by about 700 members of the New York State Fuel Merchants Association and the Fuel Merchants Association of New Jersey.

Anthracite Industry Renews Drive

A renewed drive to promote greater use of anthracite for space heating in homes and buildings was officially inaugurated March 30-31 in New York City. Spearheading the drive were the first public showing in New York City of the 45-ft "Anthracade" mobile display of automatic anthracite heating units and the First Annual (New York-New Jersey) Interstate Solid Fuel Conference. Speakers at the conference disclosed future plans for anthracite and cited encouraging new developments in hard coal sales.

Commenting on the future, Francis O. Case, president, Glen Alden Coal Co., said that "there is a tremendous merchandising job to be done. The population trend, as well as the economics of oil and gas, will in the long run aid us. The inherent qualities of anthracite, if properly exploited, can aid us in competing with bituminous coal in the mid-west home-heating market. Working together, I firmly believe that we can save a large part of our remaining market, stabilize our selling procedure and, in the long run, reverse the present down trend of our industry."

Thomas Kennedy, vice president, UMWA, renewed the union's pledge to give "the fullest cooperation to the producers and retailers of the anthracite industry to the end that this great basic industry will be enabled to realize its proper position as a basic natural resource in our economy."

Pennsylvania's new seven-point program to encourage hard coal sales was announced by John P. Robin, State Secretary of Commerce. The program is generally aimed at over-all support of current anthracite promotion. It incorporates a proposal for including an anthracite marketing study in the research program for coal now under consideration by the state legislature. This would be designed to develop better marketing and promotion methods for hard coal.

In a panel discussion on the "Future of Anthracite," H. H. Shaver, general sales agent, The Hudson Coal Co., noted a corrective trend which has occurred during 1954 in the sale of anthracite automatic domestic equipment. In September and December, 1954, he said, sales of boiler-burner units were up 33.6% and 44.6%, respectively, over the corresponding months of 1953.

The "Anthracade" will continue its tour to take the story of new and improved anthracite domestic heating equipment right to the consumer over coming months. It will cover the northeastern seaboard, visiting county fairs and other outdoor events.

U. S. Business to Boost Capital Spending in 1955

United States business as a whole plans to spend more for new plants and equipment in 1955 than in any previous year, according to the eighth annual McGraw-Hill Survey of Business' Plans for New Plants and Equipment released April 22. Manufacturing industries alone plan to spend $9.2 billion this year, about 3% more than in 1954. All U. S. business plans to spend $29.4 billion for new plants and equipment in 1955, about 5% more than the amount spent in 1954.

The largest increase among major industries, 15%, is planned by commercial companies—those in the trade, finance, construction and service industries. Gas utilities and manufacturing companies also plan to spend more than they did last year. Electric utilities, railroads and mining companies plan small reductions in their capital spending, while other transportation and communications companies and the petroleum industry plan to invest about as much as in 1954.

The rising trend of capital spending may carry far beyond 1955, judging by industry's present plans. Preliminary plans for 1956 are only about 3% lower than plans for 1955. If preliminary plans are revised upward—as they have always been in the past—1956, 1957 and 1958 will be years of high, and perhaps record, capital expenditures by business.

Manufacturing companies expect their sales to increase by an average of 7% in 1955 and 21% over the 4-yr period, 1954-1958. Manufacturers were operating at an average rate of 84% of capacity at the end of 1954, whereas on the average they regard 89% as an ideal operating rate. But if both their sales expectations and plans for increasing capacity are realized, they will be close to their preferred operating rate by 1958.

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News Briefs and Trends

Steel Production Rises To Near Record High

The domestic steel industry scheduled production the week of April 18 to 95.5% of rated capacity, the highest rate so far this year, the American Iron and Steel Institute has reported. Output at such a rate would be 2,305,000 net tons of ingots and steel for castings, and would be the second highest on record, exceeded only by the 2,324,000 tons produced in the week of March 23, 1953. Monthly tonnage for March was the third highest on record and production in the first quarter was at the highest level since the third quarter of 1953.

Bituminous 13% Ahead of 1954

Bituminous coal production in 1955 totaled 117,868,000 tons through April 9, an increase of 13% over the 104,351,000 tons mined in the same period of 1954, according to USBM figures. Production in the week ending April 9, 1955, was 8,200,000 tons, compared with 7,350,000 tons in the previous week and 6,768,000 tons in the comparable week of 1954. A month earlier, up to March 10, bituminous output for 1955 was running 10.3% ahead of 1954. Anthracite totaled 7,157,000 tons through April 9, down 9.2% from the 1954 period. Up to March 10, 1955, it had been 7.0% below the comparable 1954 output.

Hanna Shovel Tops Own Mark, Moves 2,057,438 Yd in Month

A 46-cu yd shovel at the Georgetown (Ohio) stripping of the Hanna Coal Co. established a new monthly record for overburden removal when it moved 2,057,438 yd of material during January, 1955. In setting the mark, the crew of the "A" shovel topped by a wide margin its previous all-time record of 1,727,606 yd handled in the month of October, 1954 (*Coal Age*, February, p 124). Since publication of an earlier monthly record of 1,522,154 (*Coal Age*, October, 1953), crews of both the "A" and "B" shovels have consistently pushed their monthly yardage upward, according to Hanna reports. During January, the 46-A shovel operated in banks averaging 28.98 ft high, handling an average of 41.71 cu yd per pass or 3,178 yd per hr. Actual operating time was 92.83% of the available time. In October, the highwall averaged 41.95 ft and operating time was 95.03% of the total available.

Pa. Coal Freight Rates Cut To Meet Truck Competition

Permission for five railroads to reduce freight rates on anthracite coal shipped to the Philadelphia area was granted by the Pennsylvania Public Utility Commission April 20. The new rate, representing savings of up to 68c a ton, will be effective May 1. The railroads had sought the reductions to meet trucking competition, reporting that rail tonnage shipped to the area had dropped one-third in the last 5 yr.

Coal Representatives Testify on Staggers Bill

The Nation has already passed the "peril point" in exhausting natural gas reserves, coal industry representatives told the House Interstate and Foreign Commerce Committee April 20 during hearings on amendments to the Natural Gas Act. They called for enactment of the Staggers bill (*Coal Age*, April, p 85) to conserve gas supplies and enable the coal industry to remain strong in the interests of the national defense and economy. Support of the National Coal Association and the Anthracite Institute was stated by Rolla D. Campbell, general counsel, Island Creek Coal Co.; Dr. Ford K. Edwards, NCA director of coal economics; and Robert E. Lee Hall, NCA Counsel. Mr. Campbell told the committee that the scarcity of natural gas, estimated at only a 22½-yr supply, and the nation's requirements for a healthy coal industry for national defense should make it clear that the public interest requires immediate amendment of the Natural Gas Act as proposed by the Staggers bill.

1955 Profits Seen for Two Anthracite Firms

Philip Godfrey, a large stockholder of the Glen Alden Coal Co., and H. W. Bradbury, president, Lehigh Valley Coal Co., are optimistic on the earning potentials of their respective companies. In a letter sent to other stockholders, Mr. Godfrey said that he believes that the Glen Alden Co. can earn about a $1,000,000 profit from coal mining operations during the first and last quarters of 1955. He attributes the company's improved profit-making potential to the reduction of mining costs through mechanization and to the sale of its retail divisions which, over coming years, will permit accumulation of investment capital for product diversification. The Lehigh Valley Coal Co. showed a profit of about $508,000 during the first quarter of 1955, President Bradbury said, as compared to a loss of $480,000 in a similar period last year. "Expenditures are being made almost daily to improve our properties and effect greater efficiency and savings," he added. "We are joined with other large, stable coal companies in a great competitive fight for our share of the fuel market. We are combined in the promotion of anthracite with associations whose main job is publicizing consumer and industrial advantages of hard coal."

Expansion Proposed by Peabody

A recapitalization plan was to be voted on by stockholders of the Peabody Coal Co. at a special meeting April 22, according to President Otto Gressens. The proposed recapitalization is to permit Peabody to issue additional common shares for sale or for "acquisition or development of desirable operating properties." Under the plan, authorized common shares will be raised from the present 4,000,000 to a new 9,000,000. Authorized 5% cumulative convertible prior preferred would be cut from 933,869 to 562,608 shares, the number presently outstanding. The $100 par preferred, 70,517 authorized but unissued, would be retired.

Ohio Shelves Conveyor Plan

The Ohio House in March virtually killed a bill proposing public utility status for the 103-mi conveyor belt from Cleveland, on Lake Erie, to E. Liverpool, on the Ohio River. Further consideration of the measure, defeated twice before during the past 6 yr, was indefinitely postponed. The Riverlake Conveyor Belt Lines, Inc., a subsidiary of the Akron, Canton & Youngstown R.R., proposed building the belt at a cost of $300 million. It is intended to carry ores from lake freighters to the south and bring back coal to Cleveland. Other railroads successfully fought the measure, which would have given Riverlake the right to condemn property under the power of eminent domain. Governor Lausche expressed his displeasure over defeat of the bill.

More News Briefs on p 172

MEETINGS

American Mining Congress. Coal Convention and Exposition, May 16-19, Cleveland, Ohio.

Indiana Coal Mining Institute: Meeting, June 11, Terre Haute House, Terre Haute, Ind.

West Virginia Coal Mining Institute: Spring Meeting, June 24-25, Daniel Boone Hotel, Charleston, W. Va.

Rocky Mountain Coal Mining Institute: 51st Annual Meeting, June 26-29, Colorado Hotel, Glenwood Springs, Colo.

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Bituminous Coal Research

What's Needed . . . What's Available . . . What's Planned

Effective translation of the needs of coal salesmen and fuel engineers into research programs, and of research results into effective sales and service keynote BCR's Second Techno-Sales Conference and 1955 Annual Meeting. On April 12, coal salesmen and fuel engineers listed their needs, and researchers and application engineers reported on fulfillment to date and prospects for the future. On April 13, BCR and independent researchers reported on research progress, needs and possible results.

INDUSTRY MEETING—
A Special COAL AGE
Staff-Written Report

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"2. By improvement of what I might call the 'climate' for coal. . . . If, through BCR we endeavor to build up fundamental knowledge of coal, our salesmen will look better in the eyes of our customers.

"3. By supplying salesmen with continuing data" on coal qualities and performance.

In the utility field, "might not a continuing study not only of coal for steam generation but of competing fuels as well give us fundamental information to strengthen our position" price and otherwise? Specifically, data on fuel values, sulphur and ash competition are becoming more vital.

In coking, there is a much greater body of data and more specialists on both the selling and buying sides, but BCR could help in standardization of coal tests, expansion and fluid properties, sulphur, blending and development of markets for carbonization products.

H. J. Spear, assistant general manager of sales, Eastern Gas & Fuel Associates.

Small Industrial Sales

"Where fuel is used for power, processing and space heating in manufacturing plants needing 5,000 lb or more steam per hr. This market therefore will include the 1-car-per-week account up to the super-industrials using 10 times that amount or more per day."

It is not BCR's function to provide tools for salesmen to compete against salesmen. "But I do conceive it to be a function of BCR to provide the competitive facts, figures and devices to enable any salesmen, company or district to compete with other forms of energy" and "keep industrial consumers on solid fuels as against other and more-convenient forms of hydrocarbons."

BCR does not have resources to carry on large-scale research to improve thermal efficiency in large plants, and slight differences in efficiency are not the difference in making or losing a sale. The practical approach is not only to "learn what we can do but also learn what oil and gas can do." Specific things BCR can do along these lines include (1) keeping down the labor costs in coal plants, since one man per day in a 30,000-tons-per-year plant is 10 to 15¢ per ton of coal fired; (2) providing coal salesmen with rule-of-thumb costs on using coal, including coal and ash handling, compared to oil and gas, for steam installations of 2,000 to 70,000 lb pr hr; (3) continuing work on air pollution.

"A practical package boiler in the range 5,000 to 20,000 lb of steam per hr would make a sizable contribution in the industrial field."

O. L. Scales, vice president, Enos Coal Mining Co.

Commercial and Small Industrial Sales

"Commercial and small industrial plants burning from 50 to 5,000 tons" a year are most susceptible to "convenience and lower manpower" arguments of oil and gas. The salesman's job is to retain present customers on a sound basis and reconvert lost customers back from gas and oil. "To aid the commercial and small steam salesmen in the future, I recommend the following program for BCR:

"1. That one sales-help booklet be prepared to replace the previous separate booklets. These should be made available to coal companies at as low a cost as possible to permit general distribution by member companies to customers through sales personnel.

"2. Development with boiler and stoker manufacturers of a package unit that will handle the heating or steam load of a building or plant using up to 500 tons per year. These should cover various loads in 50-ton steps. The continued development of the automatic steam generator to compete with 'package-type' oil burners is a sound move in this direction.

"3. Development through direct association with the national associations of architects, designers and builders of the picture of how efficiently and effectively coal can be burned. In most communities, the coal-selling organizations are fortunate if they have 10% of the architects and builders stressing the usage of coal. Much work must be continually done in this direction.

"4. Development through colleges and universities of more courses on the proper combustion of coal, including economies, wide range of types, etc.

"5. Preparation of a booklet for distribution to city and council governing bodies to acquaint them with the possibility of purchasing steam for city and county buildings from existing coal-fired industrial plants in their communities," as in Rice Lake, Wis.

M. Burke Jr., executive vice president, North Western-Hanna Fuel Co.

Residential Sales

"The meeting of today should have been held 30 yr ago to have benefitted the coal industry most." Nevertheless, the question today is "Where do we go from here?" Some indication of needs in selling coal for residential use is derived from specific answers from salesmen, who list, among other things, automatic equipment, including feed and ash removal; low-priced stoker equipment; and better manuals for servicing domestic-heating units. There were no new suggestions. All have been talked up before, but "What have we done?"

"Summing up, the one thing we need most and the thing we have not begun to lick is to burn coal fully automatically. We must devise some method for automatic ash or clinker removal."

C. R. Griffith, president, Southern Coal & Coke Co.

"The residential market is a very important one to our industry. Hundreds of mines would close if we did not have this business." Things to be considered include:

1. The problem of residential and small commercial stoker replacement in the next 5 yr.
2. Development of a really low-priced basic residential stoker.
3. BCR-inspired, sponsored, developed and executed servicing of residential heating equipment available to retailers and sales personnel.
4. Promotion and marketing of the BCR furnace, now available after 8 yr of development.

E. H. LaRue, vice president, Princess Coal Sales Co.

Engineering Needs

"We most recognize the fact that regardless of the basic form of the fuel, in the combustion process we are concerned with the application of a gas. . . . It appears to me that we need to have a full and complete program of research and development relating to gas producers. . . . Surely, there must be many applications where, with proper development, a coal-fired gas producer would be the most satisfactory."

Other directions BCR can function to help the fuel engineer include:

1. Gas production by low-temperature carbonization.
2. Investigation of ultra-sonic waves in furnaces to promote combustion and reduce fly ash, smoke, slagging and scale formation.
3. Development of curves showing heat release, furnace temperatures and slagging temperatures.
4. Development of the relationship between moisture content and mill capacity in pulverization.
5. More care in producing a quality home stoker.
6. More even delivery of coal to prevent penalizing the consumer in storage charges.
7. Consideration of the possibilities of a "Seal of Approval" on coal.

U. B. Yeager, fuel engineer, Island Creek Coal Sales Co.

"An engineer has two basic types of problems: Those concerned with the application of solid fuels in general, and those pertaining to a particular company or coal. BCR could be expected to help in the former. We must solve the latter ourselves. . . .

"Our best defense against oil and gas competition is to mount a formidable offense through equipment, fuel quality and service. We must first understand competition before we can efficiently combat it. We do that by recognizing its qualities as well as its disadvantages. BCR could be of service in determining where and how coal can be logically applied in preference to gas and oil.

"Package units for oil and gas rate as serious competition. We could well use data on first costs, maintenance, operation and average life of such units compared to coal-burning units. Of special importance is the cost of operating a package oil unit on loads where frequent off periods occur and oil must be kept hot either by maintaining steam pressure or using electric heating for this purpose. We also need investigation of costs of heating and handling No. 6 or Bunker C oil in various sizes and types of plants."

R. I. Bush, combustion engineer, Eastern Gas & Fuel Associates.

Earl C. Payne

Julian E. Tobey

Honored for Research Contributions

For exemplary achievements in promoting coal-research support, utilizing BCR research results to expand markets, and otherwise contributing to the progress of the bituminous industry through BCR activities, 1955 annual awards of Bituminous Coal Research, Inc., were made April 13 to Earl C. Payne, consulting engineer, Pittsburgh Consolidation Coal Co.; and Julian E. Tobey, president, Appalachian Coals, Inc.

Mr. Tobey was a member of the original Technical Advisory Board and served as its chairman for many years. He was elected a member of the board of directors in 1953. Mr. Payne is chairman of BCR's residential and small commercial uses advisory committee, a member of the operating committee of the Locomotive Development Committee, and a member of the advisory committee of the Great Lakes Air Pollution Abatement Program. In addition, he has been chairman of the motive power and small plant advisory committees and a member of the technical advisory board, technical executive committee, industrial utilization committee and the committee on railroad electrification, all former BCR committees.

Meeting Marketing Needs: Utility and Industrial

Steps which BCR has taken to meet the sales and engineering needs in the utility and industrial markets include:

1. Development of overfire air jets for smoke abatement.
2. Cooperation in the Great Lakes Air Pollution Abatement Program, cutting objectionable smoke 77% in 3 yr.
3. Combustion conferences for better coal firing.
4. Development of methods of arresting and collecting fly ash, and of markets therefor.
5. Development of efficient coal- and ash-handling systems.
6. Study of the basic economics of electric steel furnaces and railroad electrification.
7. Development of manuals and guides to help industry utilize coal better.
8. Development of an automatic coal-fired packaged boiler, competitively priced—"the very kind of unit so badly needed not only to meet oil and gas competition but also to recapture accounts now using competitive fuels. The unit has undergone sufficient tests to establish its practicability. Costwise, there is every reason to believe that it can be built to sell competitively with packaged oil-fired boilers."

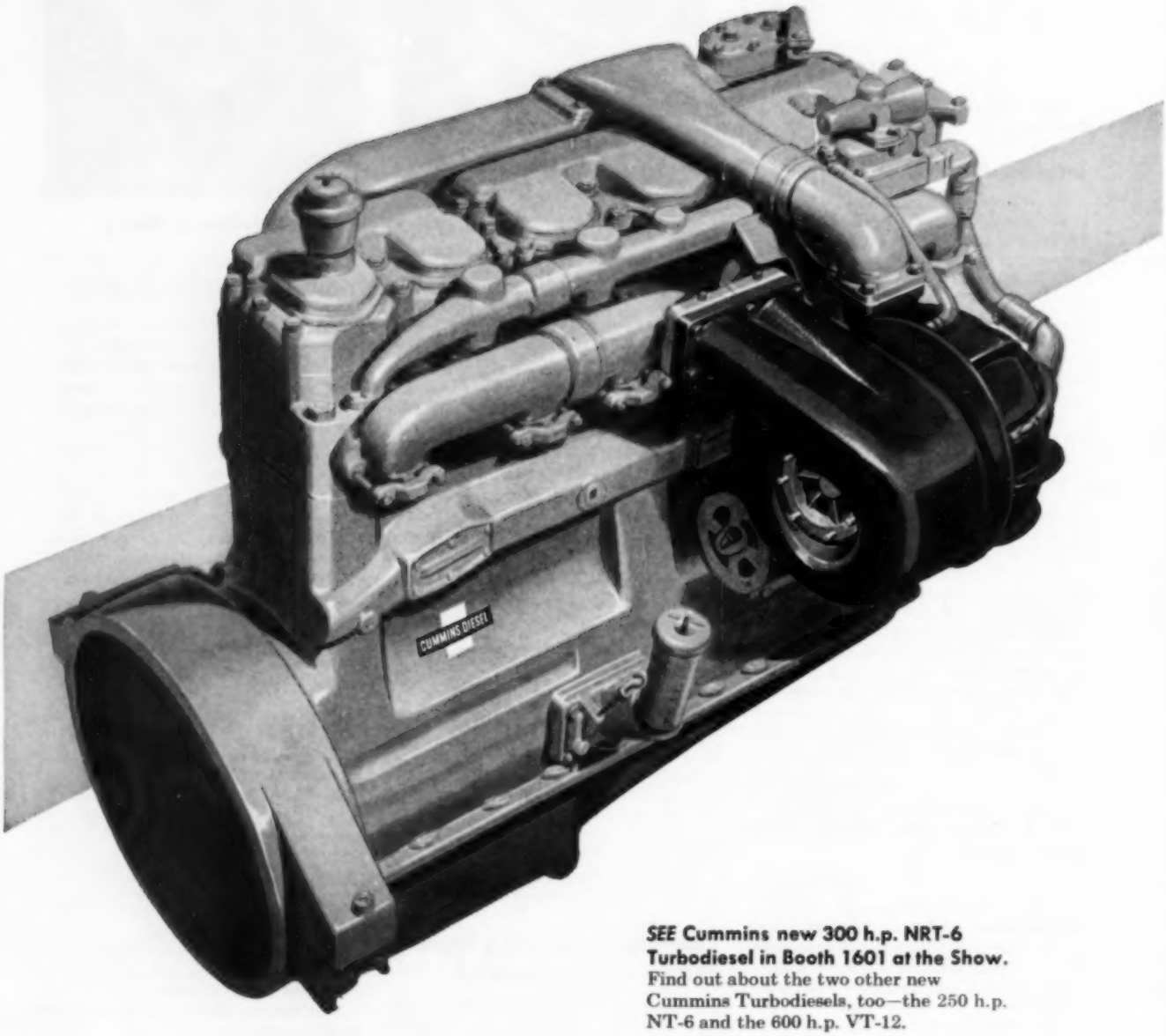
E. D. Benton, director of research, Ohio Coal Association.

Meeting Marketing Needs: Commercial, Small Industrial, Residential

"It is quite apparent that the engineering and research conducted by BCR is far ahead of the sales efforts of the other phases of the coal industry with regard to residential and small commercial heating equipment. Coal also has

Continued on p 192

NEW TURBODIESEL



***SEE* Cummins new 300 h.p. NRT-6 Turbodiesel in Booth 1601 at the Show.**
Find out about the two other new Cummins Turbodiesels, too—the 250 h.p. NT-6 and the 600 h.p. VT-12.

BY CUMMINS

ups your production

and lowers your costs!

Cummins 300 h.p. turbocharged NRT-6 pulls full loads faster, permits higher speeds on grades, cuts cycle time, because it produces greater horsepower without increase in engine size or displacement.

Turbocharging—which harnesses exhaust gases normally wasted—produces this extra horsepower by achieving a more perfect air-fuel mixture in the combustion chamber. There is no parasitic load as in supercharged engines. This means drastically reduced fuel costs . . . fewer internal stresses . . . longer engine life.

In addition, Cummins exclusive PT fuel system is simple and trouble-free . . . makes fuel system maintenance costs negligible. It is so easy to understand and work with that no specialists are needed. And all Cummins Diesels run on inexpensive No. 2 diesel fuel or furnace oil.

For further information, see the Cummins distributor in your area, or send us this coupon today.

CUMMINS

Cummins Engine Company, Inc.
Columbus, Indiana

Leader in rugged, lightweight, high-speed diesels (60-600 h.p.)

Cummins Engine Company, Inc. Dept. CA-5
Columbus, Indiana

Please send me detailed information on Cummins new NRT Turbodiesel.

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Personal Notes

Harry W. Bradbury has been elected president of Lehigh Valley Coal Co., Kingston, Pa. Mr. Bradbury has been executive vice president of the company since its control was taken over by New England Industries, Inc. The presidency had been vacant since that time, when L. R. Close, president for many years, resigned.

Robert Cooper, assistant district superintendent for U. S. Steel Corp. mines in McDowell County, has retired after almost 39 yr of service to the company. He started with U. S. Steel as a clerk, serving in this capacity at various mines, and was later made assistant superintendent of the firm's Gary mines No. 7, 8 and 9. He was promoted to superintendent and assigned to Mines No. 4, 5, 10 and 12 in 1939. In 1953, Mr. Cooper was transferred to the position of assistant to the district superintendent, which post he held upon retirement.

R. N. Norris, formerly of Harrisburg, Ill., has been appointed assistant to R. W. Fox, vice president in charge of production, Powhatan Mining Co., Red Parrot Coal Co. and C. H. Mead Coal Co., divisions of North American Coal & Dock Co. **Arthur Woodward** has been named chief engineer of the Red Parrot Div.

The Boone County Coal Corp., Sharples, W. Va., has appointed **H. W. Bauer** project engineer.

Russell Harman has been elected vice president and controller of the Princess Elkhorn Coal Co. and its affiliates, the Powellton Coal Co., Mallory Stores, Inc. and Princess Coal Sales Co., according to David L. Francis, president, Princess Elkhorn, Huntington, W. Va. Mr. Harman will retain the office of secretary and treasurer of the affiliated firms which he has held since 1952.

F. P. Kerr has been appointed superintendent, Sarah Ann No. 4 mine, Crystal Block Coke & Coal Co., Sarah Ann, Logan County, W. Va.

Merwin Williams, assistant foreman in the Hillman Vein section of the Dorrance colliery of the Lehigh Valley Coal Co., received an engraved plaque as a merit award for outstanding performance at a dinner meeting of company and colliery officials held April 15. Presentation of the company's award was made by Thomas Price, Dorrance superintendent, and Stanley Evans, inside foreman, was toastmaster. Speakers included Harold Wickley, vice president in charge of operations.

Frank K. Ettari has been named vice president in charge of sales for the Dexter-Carpenter Coal Co., Inc., New York, according to an announcement by W. H. Carpenter, president. Mr. Ettari joined the company in 1950 and has served as district manager in New England and Philadelphia since that time.

Given Heads NCBPE

IVAN A. GIVEN, editor of *Coal Age*, has been elected president of the National Conference of Business Paper Editors, the professional organization of business paper editors affiliated with the 158 Member Magazines of The Associated Business Publications. Mr. Given, previously a member of the organization's executive committee, took office April 1, succeeding Roger Barton, editor, *Advertising Agency* and *The American Printer*. A graduate of West Virginia School of Mines, Mr. Given joined the *Coal Age* staff in 1928 and became editor in 1944.

Obituaries

Fred L. Zollinger, retired assistant to the general manager of The Hudson Coal Co., died March 26 at his home in Scranton, Pa., following a heart attack. Mr. Zollinger was affiliated with Hudson Coal more than 40 yr. He served as superintendent of various collieries, including Loree, and retired early this year.

John H. Wallin, 67, president, Central Pennsylvania Open Pit Mining Association, died March 23 at the Philipsburg (Pa.) state hospital.

Harold L. Ripley, 47, partner with Robert Fleagane in the R & F Coal Co., Cadiz, Ohio, died at Youngstown, Ohio, March 22. Mr. Ripley came to Cadiz in September, 1948, and stripped coal in the Toronto-Richmond area in Jefferson County, Ohio, and near Dunbar, Pa. After joining Mr. Fleagane, they began stripping operations near Flushing and Lafferty, Ohio.

COAL MEN ON THE JOB . . .

50 Years Without an Accident

GEORGE WASHINGTON BARNETT (above), section foreman, Sayre mine, Republic Steel Co., Sayre, Ala., had a double reason to celebrate during the month of February this year. As well as being the birthmonth of the famous American whose name he bears, February, 1955, was an important anniversary for Mr. Barnett—marking his completion of 50 yr in the mines of Republic and predecessor companies without a lost-time accident.

South-East Coal Co. Sells 200 Miners' Homes

Four Whitesburg, Ky., businessmen have purchased about 200 miners' homes in nearby Millston and Seco from the South-East Coal Co. The homes were bought at a cost of about $80,000 by D. W. Little, William Conley, Herman Hale and Melvin Adams, operating as the Millco Co. Harry Laviers, president, South-East Coal Co., said the property was obtained years ago to enable employees to live near the workings. Mr. Laviers added that the holdings became unnecessary as transportation and highways improved. The houses probably are expected to be resold, with present occupants having the choice of buying or vacating.

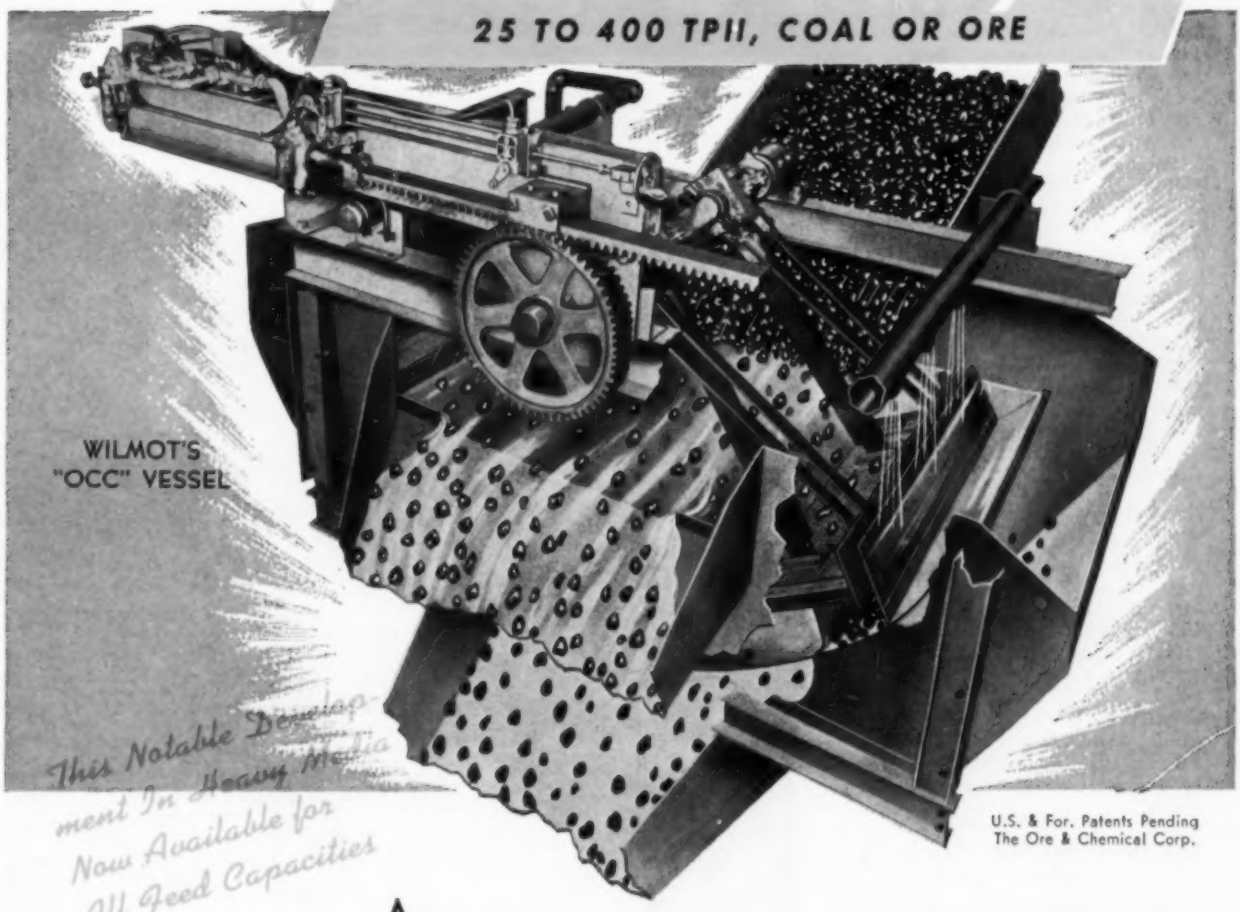
Preparation Facilities

Minersville Coal Co., Inc., Minersville, Pa.—Shipment by the Deister Concentrator Co. of one SuperDuty Diagonal Deck No. 7 coal washing table for cleaning No. 5 buck anthracite coal.

WILMOT'S *New* HMS VESSEL

Now in 7 Sizes

25 TO 400 TPH, COAL OR ORE



This Notable Development In Heavy Media Now Available for All Feed Capacities

U.S. & For. Patents Pending
The Ore & Chemical Corp.

An examination of the features of Wilmot's recently introduced "OCC" vessel will, we believe, confirm that here is a notable new development in Heavy Media: (1) entire separating process is performed with only the mechanism and power required for lifting the sink from pool; (2) permits continuous visual inspection; (3) few moving parts; (4) requires little floor space. We assure you that you will find the performance records of the "OCC" vessel genuinely impressive: both in the uniformity of production efficiency, and the really remarkable freedom from maintenance needs.

We Invite You **to send for bulletin about the "OCC" vessel. Or, better, see it in operation. We'll gladly test samples of your feed, coal or ore, at our White Haven, Pa., pilot plant.**

WILMOT

See Working Model at Our Booth 837, Coal Show

WILMOT ENGINEERING CO. HAZLETON, PA. *Plant:* WHITE HAVEN, PA.

Among the Manufacturers

ACCO Names Sales Chief

Appointment of Vincent E. Lysaght as general sales manager of the American Chain & Cable Co., Inc., New York, has been announced by Henry Ervin, vice president. An MIT graduate, Mr. Lysaght has for many years been recognized as an authority on hardness-testing of metals. His book, "Indentation Hardness Testing," which was published in 1949, has wide acceptance in this specialty field. He was formerly divisional manager of the Helicoid, Campbell Machine and Wilson divisions of American Chain & Cable.

Hulburt Advances Schwanke

The Hulburt Oil & Grease Co., Philadelphia, has announced the appointment of O. A. Schwanke as eastern sales manager. He has represented Hulburt for the past 20 yr and is widely known throughout the mining industry. Mr. Schwanke is affiliated with various mining and engineering societies and has conducted field experiments in lubrication, both outside and underground, for many years. He will continue to reside in Greensburg, Pa.

Heyl & Patterson Sales Head

Edward H. D. Gibbs has been appointed vice president in charge of sales of Heyl & Patterson, Inc., Pittsburgh. Mr. Gibbs joined Heyl & Patterson in 1948 as a contracting engineer, serving in that capacity until he became sales manager last September. Prior to joining Heyl & Patterson, he had worked since 1937 for U. S. Steel Corp. in various engineering capacities, except for a 4-yr period during World War II when he served as an Air Force Intelligence officer.

SKF Executive Vice President

Edwin R. Broden has been elected executive vice president, SKF Industries, Inc., Philadelphia. Mr. Broden was formerly executive vice president and a director of the Carborundum Co., Niagara Falls, N. Y., which he joined in 1944 as vice president in charge of operations. Previously, he was division manager, Blaw-Knox Co., Pittsburgh.

Jeffrey Announces Changes

John L. Phillips Jr., formerly assistant manager of mining apparatus sales, Jeffrey Mfg. Co., Columbus, Ohio, has been named district manager of mining sales for the company's Beckley, W. Va., territory, according to A. R. Anderson, general manager of mining sales. He succeeds E. H. Hebden, Beckley manager since 1947, who has returned to Columbus as manager of mining renewal parts sales. Several changes designed to further streamline Jeffrey's engineering services also have been announced by James A. Flint, vice president in charge of engineering. Harold C. Medley, with the company 18 yr, has been made chief engineer of the conveyor division and has been succeeded as manager of the conveyor research and development section by Arnie J. Kindig, formerly in charge of chain and belt idler research. Morton B. Curley, with the company for 20 yr and formerly assistant to the vice president in charge of engineering, has been named chief engineer of the mining division. John Beltz has moved into the newly created post of chief consulting engineer to the mining division. A Jeffrey veteran of 39 yr, Mr. Beltz previously was chief engineer for the division.

Barrett Joins Daniels

Orrin T. Barrett has joined the staff of The Daniels Co., Contractors, Inc., Indiana, Pa., as preparation engineer. Mr. Barrett was formerly superintendent of The Brazilian National Steel Co., Brazil, and was a mining engineer in the Preparation Dept., Pittsburgh Consolidation Coal Co., and in the Coal Preparation Section, USBM.

Cummins Engine Appoints Three

Paul J. Every has been named assistant general sales manager, a newly created post of Cummins Engine Co., Inc., Columbus, Ind., it was announced by C. R. Boll, general sales manager. Mr. Every, associated with Cummins since Nov. 1, 1947, as manager of regions, was in

COAL MEN ON THE JOB . . .

No. 31 Colliery, Pocahontas Fuel Co., Inc., Amonate, Va.

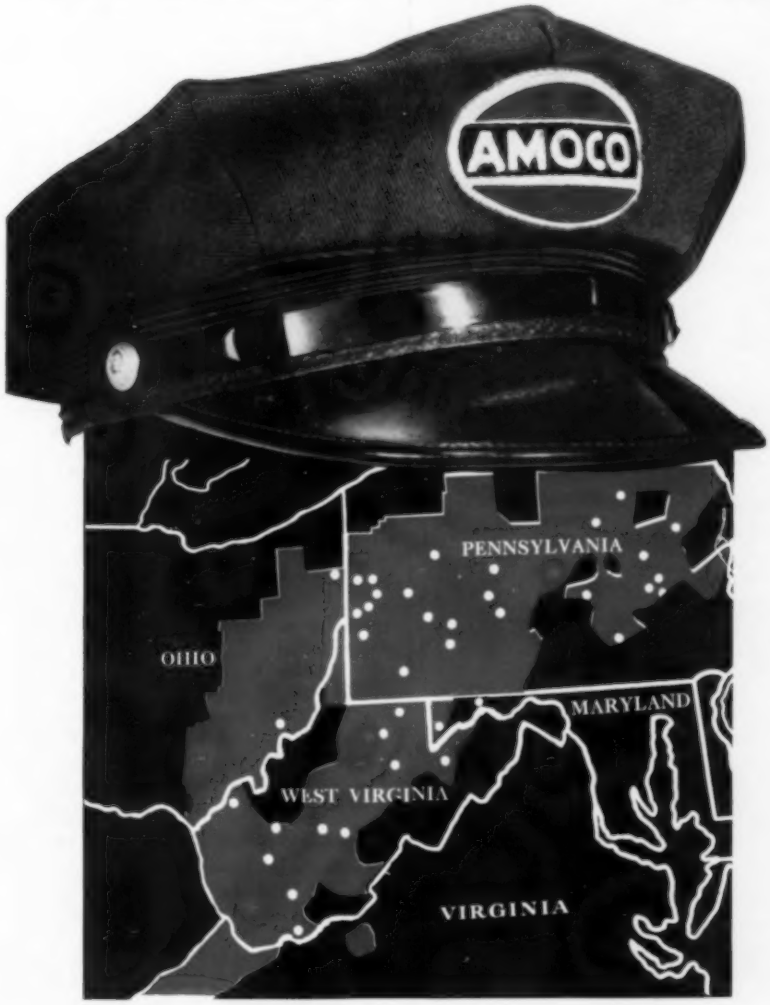
FIRST SHIFT (top photo), section foreman except as noted—Front row: Ed Blankenship, mine foreman; Baker Henderson; Jack Goodwin, assistant superintendent; Litz Reed; Paul Brown, construction foreman; B. D. Humphrey, dispatcher; James McNeal; and Alfred Holland. Standing: Tommy Bailey; Homer Lewis; Hoyt Atizer; A. V. Gibson; Mack Nash, supply man; Ellsworth Knight, mining engineer for the company; Robert Gray; Harvey Barton; Barrett Sykes, track foreman; and Leroy Justice, engineer.

SECOND SHIFT (bottom photo), section foreman except as noted—Front row: Judson Bowman; Robert Artis, night mine foreman; A. L. Griffith, maintenance foreman; James Murphy; Clifford Russ; and Johnny Beavers. Standing: Irwin Sampson, superintendent; Mack Dillon; Clyde Boothe; Willard Hardy; Bramble Davidson; James Michel; and Bob Little.

We put service on the map throughout AMOCOal land

Amoco branch offices are spotted throughout AMOCOal land—never further from you than the nearest telephone.

- **FINEST specialized mine lubricants available—PARAMO OILS, AMOLITE OILS, AMOCO LEADED LUBRICANTS, AMERILUBE GREASES.**
- **INSTANT delivery from nearest Amoco branch in your area . . . no delays.**
- **EXPERT engineering assistance on mine lubrication and machinery maintenance problems.**



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to stay with West Virginia roof bolts

- New type — extra large expansion
- Restraining spring permits easy entrance into hole
- Won't slip in hole — grips firmly from start to finish
- More gripping surface — will hold in soft breakable material where other bolts may fail
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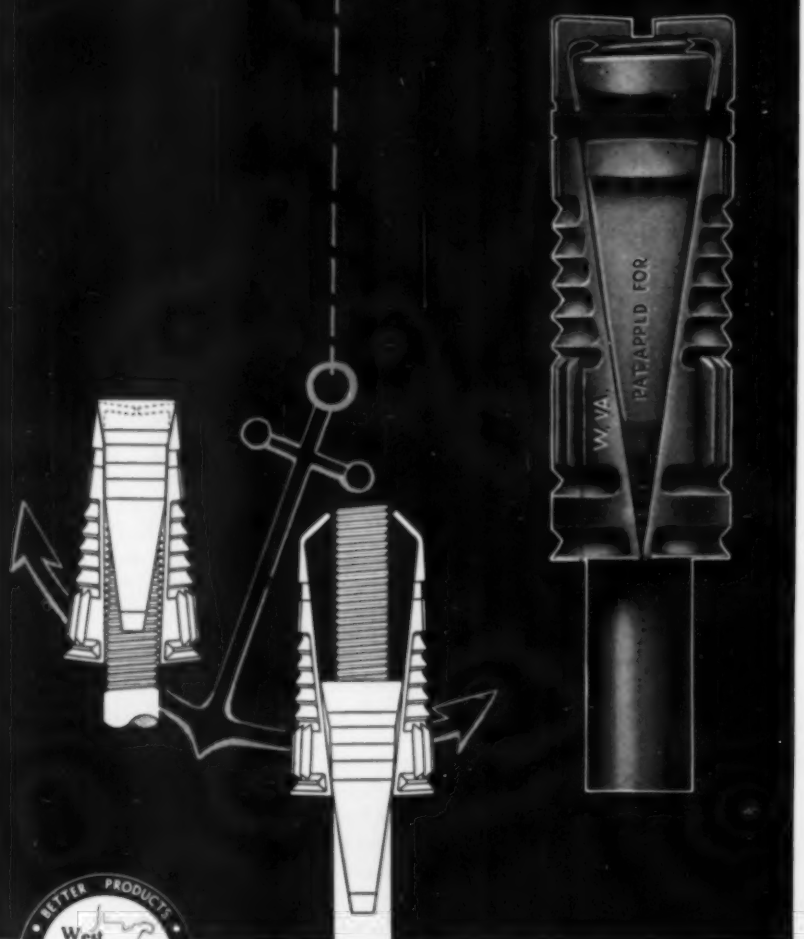

BETTER PRODUCTS West Virginia STEEL & MFG. CO. FOR BETTER MINING

See us at the COAL SHOW . . . Booth 2516

WEST VIRGINIA STEEL & MFG. CO.

HUNTINGTON, WEST VIRGINIA

charge of the 12 domestic Cummins regional offices, and the handling of domestic distributor activities. Lloyd E. Williams, Rocky Mountain regional manager since 1950, has been promoted to manager-distribution, to succeed Mr. Every. R. R. MacDonald has been appointed head of the new Piedmont Regional Office, Greensboro, N. C., consisting of the states of Virginia, West Virginia, North and South Carolina. Previously, Mr. MacDonald was manager of the Cummins branch at Milwaukee, Wis.

B-E Sales Official

Edwin T. Goree has been appointed assistant sales manager, excavator distributors, Bucyrus-Erie Co., S. Milwaukee, Wis. Mr. Goree will assist R. C. Adams, recently named sales manager of Bucyrus-Erie's distributor organization upon the promotion of L. E. MacDonald to general sales manager. Mr. Goree joined Bucyrus-Erie in 1947 in export sales, and since 1951 has been B-E field representative for Mexico.

G-E Promotes Hopper

Douglas A. Hopper has been named general manager of General Electric's Welding Dept., York, Pa., Harold E. Strang, vice president and general manager of the company's Measurements and Industrial Products Div., announced. Formerly manager of G-E's Warehousing and Field Services, Large Lamp Dept., Nela Park, Cleveland, Mr. Hopper succeeds Raymond C. Freeman, who has been appointed manager, Engineering and Operations, Atomic Power Equipment Dept., Schenectady. Mr. Hopper joined G-E at Schenectady in 1933.

Worthington Shifts Officials

J. H. Loomis has been appointed manager, St. Louis office, Worthington Corp., it has been announced by W. A. Meiter, general sales manager. Previously, Mr. Loomis had been serving as general line salesman and compressor specialist at the Worthington Chicago district office. P. A. Mack, former manager of the St. Louis office, has been named special representative, and will devote his full time to special customers and assignments. Associated with Worthington for 40 yr, Mr. Mack served as manager of the St. Louis office for 23 yr prior to his present appointment.

Byron Jackson Names Jesse

Norman D. Jesse has been made vice president in charge of sales, service and branches, Pump Div., Byron Jackson Co., it was announced by President E. S. Dulin. Mr. Jesse has been with the company since 1939 and is now manager of the Eastern branch of the division with headquarters in N. Y. Lynn Sawyer, vice president and general manager of the Pump Div., is taking a 6-mo leave of absence at his own request, Mr. Dulin reported. Afterward, Mr. Sawyer will return to the company with important new responsibilities to be announced at that time. William N. Beadle, formerly a vice president in the Pump Div. and who retired from active management in 1954, is continuing in a consulting capacity.

Where there is mechanized coal mining...

FIRTHITE "Blue Bits" ARE STOCKED

In all the major coal producing areas of the country Firthite famous "Blue Bit" mining tools are available from stock from Firth Sterling distributors. More than just "availability," however, recommends them to your use.

ROOF BITS

Firthite "Blue Bits" for roof drilling are made in 3 styles: RD-L for light uses and very soft roof rocks; RD-H with extra heavy duty insert to resist gage wear for most difficult roof drilling; RD5 (slotted) for faster drilling of medium to hard roofs. All are water channeled for either wet or dry work.

Firthite Quality Carbides

Firthite mining inserts have been metallurgically engineered to withstand the severe shocks and abrasion of drilling in all types of formations, and tip designs assure free cutting and low power consumption.

Premium Alloy Shanks

A carbide tool is no better than its shank! "Blue Bit" shanks are drop forged from premium alloy steels, machined to uniform dimensions and skillfully heat treated to the proper degree of hardness and toughness to withstand the high torques and pressures encountered in mining uses.

Controlled Quality

Shanks and tips are bonded together with premium quality silver alloy, resulting in what field tests have shown to be the strongest braze in any carbide mining tool—all carefully *controlled* by frequent Izod impact testing to a measured impact and statistically checked.

Engineering Service

Too, there's a Firthite Engineer located in your coal producing area, always ready to become familiar with your operations and to assist in solving your cutting, drilling and roof bolting problems.

DRILL BITS

Firthite "Blue Bits" for rotary drilling available in 3 styles:—D with either square or hex shank for use with any standard drilling equipment; DV (illustrated) for faster and easier hand held drilling.

MACHINE BITS

Firthite "Blue Bits" for mining machines encompass a line including a bit design, style and grade for every need. C-4-H (illustrated) is one of several designed for use in non-pure veins where the going is tough and on continuous miners.

FINGER BITS

Firthite "Blue Bits" for use in standard drill heads feature two-surface brazing with tips set in recesses for greater strength. Available in all popular sizes.

Mr. Tooley says—

Because Firth Sterling makes both steels and carbides, "Blue Bit" mining tools are as perfect as integrated production and engineering can make them. Both the carbide inserts and the alloy tool steel shanks are produced under controlled conditions by one company for maximum quality and operating effectiveness!

R-302

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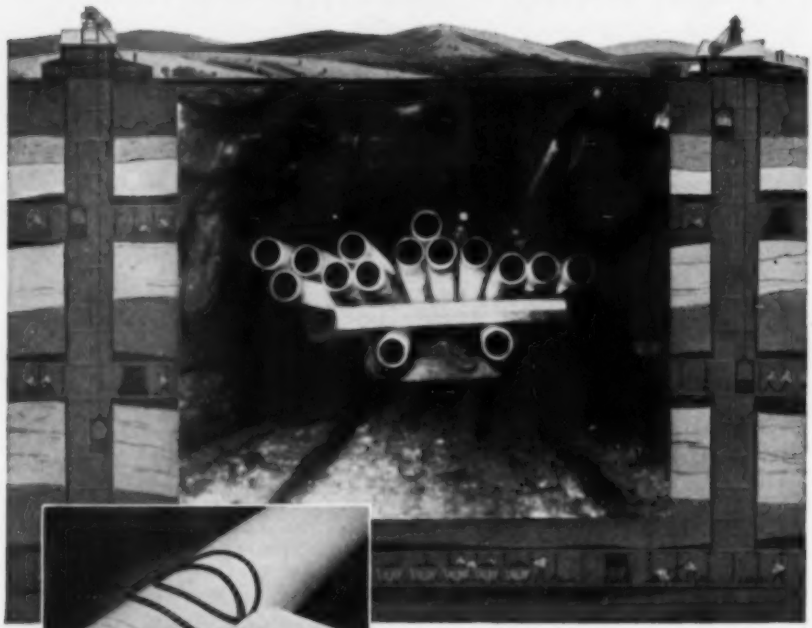
Time-proven in mine service . . .



Transite Pipe with the new Ring-Tite Coupling

Cuts installation costs through fast assembly . . . assures locked-in tightness

MINE OPERATORS have found that Transite® Mine Service Pipe offers many advantages in addition to its long service life. Now with the new Ring-Tite® Coupling, pipe goes together faster, assuring even greater savings in installation.

Proven Corrosion-Resistance

Over a period of many years' service, asbestos-cement Transite Pipe has proved its ability to stand up under the corrosive action of acid mine drainage water. It is light in weight and easily handled. Lines are quickly assembled, even in restricted mine passages. The new Ring-Tite Coupling forms a tight, yet flexible joint that permits deflections of up to 5° at each coupling.

Available for working pressures up to 150 lbs. per square inch and in a full range of diameter from 4 inches up, Transite is also a money-saving pipe for many other mine uses.

For complete information about the new Ring-Tite Coupling and about Transite Mine Service Pipe write for Brochure TR-51A and TR-142A, Johns-Manville, Box 60, New York 16, N. Y.

See us at the Coal Show of the American Mining Congress in Cleveland Ohio Booth 321

Johns-Manville
TRANSITE Mine Service Pipe

EQUIPMENT APPROVALS

Nine approvals of permissible equipment were issued by the U. S. Bureau of Mines in March, as follows:

Joy Mfg. Co.—Type 10SC6CPF-1 (modified by SBM5967) cable-reel shuttle car; two 5-, one 15- and two 25-hp motors, 500 v, DC; Approval 2-1045A; March 3.

National Mine Service Co.—Types 60PE10 and 60PE10X (Joy) cable-reel shuttle cars; one 10- and two 20-hp motors, 250 v, DC; Approval 2-1046; March 8.

Joy Mfg. Co.—Type 1CM-2BE continuous miner (with drills); four 7½-, one 15-, one 26- and two 100-hp motors, 250 v, DC; Approval 2-1047; March 8.

Joy Mfg. Co.—Type X179-117 Model 15FA chain-conveyor drive unit; 20-hp motor, 440 v, AC; Approval 2-1048A; March 9.

Joy Mfg. Co.—Type 3JCM-4E continuous miner; two 5-, three 7½- and two 65-hp motors, 250 v, DC; Approval 2-1049; March 18.

Goodman Mfg. Co.—Type 400 miner; one 50- and one 100-hp motor, 250 and 500 v, DC; Approvals 2-1050 and 2-1050-A; March 18.

Goodman Mfg. Co.—Type 580-10 cable-reel shuttle car; three 10-hp motors, 250 v, DC; Approval 2-1051; March 18.

Goodman Mfg. Co.—Type 580-11 cable-reel shuttle car; three 10-hp motors, 250 v, DC; Approval 2-1052; March 18.

Jeffrey Mfg. Co.—Electric drive for Aerodyne fan; 10-hp motor, 250 v, DC; Approval 2-1053; March 23.

Twin Disc Clutch Promotes

Jack N. Yetter has been appointed sales manager, General Products Div., Twin Disc Clutch Co., Racine, Wisc. He replaces E. C. Billings, recently retired, who will continue to act in a consulting capacity. Mr. Yetter has been associated with the Twin Disc Clutch Co. for the past 6 yr and was sales-promotion manager before his promotion.

Pennsalt Promotes

Hugh C. Land has been named to succeed William P. Drake as head of the Pennsylvania Salt Mfg. Co.'s Industrial Chemicals Div. Mr. Drake recently was named executive vice president when President George B. Beitzel announced plans to retire later this year upon completion of 25-yr service with the company. Mr. Land, with Pennsalt in various posts for 9 yr, has been manager of manufacturing for the Industrial Chemicals Div. since 1954.

Gould Names Millington

George P. Millington has been appointed Atlantic regional manager, Industrial Div., Gould-National Batteries, Inc. He will continue in the regional

$108 Saved Each Working Day On Trip Riders Alone . . . . .

How Much Would The Advantages Below Save You?

REGENT SLOPE MINE SAYS:

- "We'd need at least six trip riders—if we didn't have O-B Couplers—at about eighteen bucks a day per man."
- " . . hasn't been one coupling accident in this mine since we got O-B Couplers over six years ago."
- "Maintenance of O-B Couplers is several times less than that of any other type of coupling I've ever had experience with."
- "We don't have any runaway cars or broken trips."
- "We save valuable time the way O-B Couplers automatically couple on contact. No hands needed."

Ohio Brass

MANSFIELD OHIO, U. S. A.

IN CANADA: CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

Feeder and Trolley Materials • Control Materials • Trolley Shoes
Roof Bolt Shells and Plugs • Rail Bonds • Automatic Couplers

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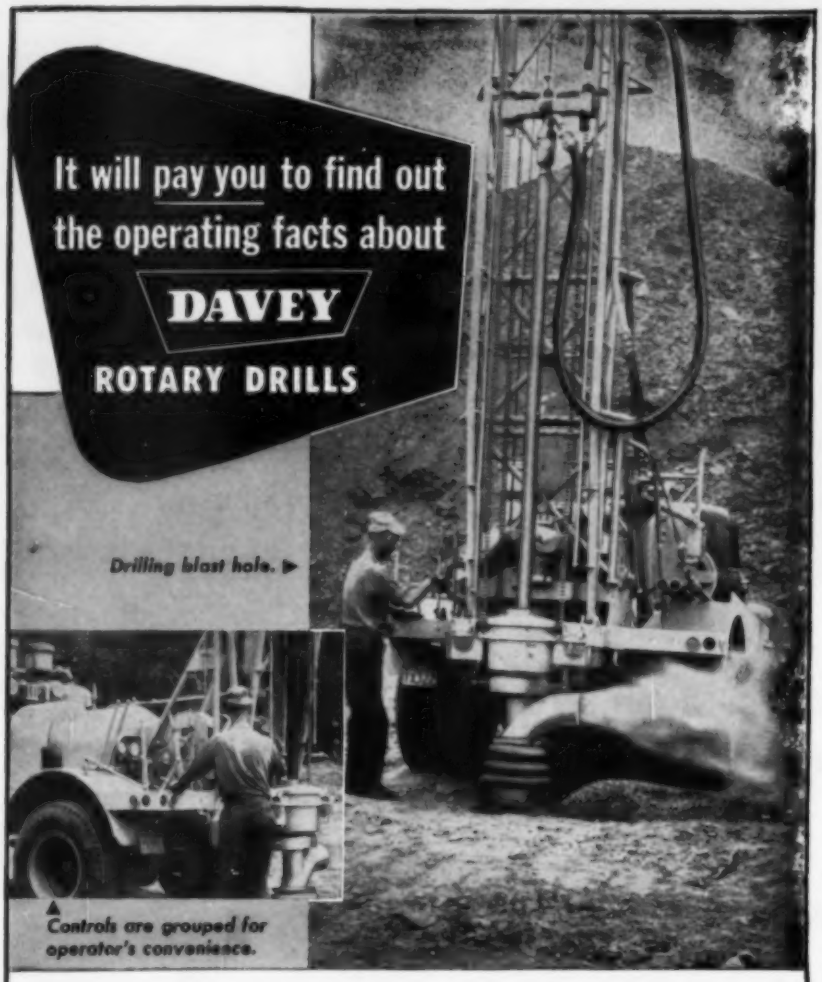


for construction jobs...coal work...quarrying

shot holes...blast holes...core drilling...structure testing
water well drilling...oil exploration

Here, at last, is the new line of rotary drills that operators have always wanted and needed.

Available in several "air blast" or "mud pump" models to meet individual requirements, Daveys drill faster and more economically than previously available units. For example, rated capacity of Model M-8A (as illustrated) is 5⅝ inch holes to a depth of 300 ft. with air and 7⅞ inch holes to 2,000 ft. with mud. Suitable for mounting on any make of truck, Davey Rotary Drills may be driven from the truck engine by a power take-off or by a separate gasoline or diesel engine. AA-202

DAVEY
pioneers of air-cooled air

Write today for Full Details!

DAVEY COMPRESSOR CO.
KENT, OHIO

headquarters office at Philadelphia, Pa., which services eastern Pennsylvania, southern New Jersey, Delaware, Maryland, Virginia and Washington, D. C. Mr. Millington joined the Gould organization in 1946 and has served as district manager of the Philadelphia office.

RE&E Staff Changes

Richard A. Geuder has been appointed assistant general sales manager, Reliance Electric and Engineering Co., Cleveland. Edward E. Helm, sales vice president, has been assigned the added duties of coordinating the merger of the recently acquired Reeves Pulley Co. Div. with the other divisions of Reliance. Reeves, at Columbus, Ind., will continue to operate as a division with Carl M. Reeves as its president. To assist at Columbus, Frank B. Carr from the Reliance home sales organization has been transferred to the Reeves division as resident coordinator. New sales engineering jobs have also been given to Reginald C. Marchant, who has been assigned to Rockford, Ill.; Thomas J. Lisy, who has been transferred from Pittsburgh to Chicago; and Gerald A. Jakes and Richard W. Palmer, assigned to Toledo and Pittsburgh, respectively.

Johns-Manville Promotes Flavin

Appointment of Edward D. Flavin as vice president, Johns-Manville Sales Corp. and manager of Special Industries, Industrial Products Div., was announced by J. A. O'Brien, vice president and general manager of the division. Mr. Flavin succeeds L. A. Baldwin, who retires after a 35-yr career with the company. Mr. Flavin joined Johns-Manville in 1929 as a sales representative in the Syracuse district and held various sales posts before his promotion to assistant manager of the Special Industries Dept. in 1953.

Dorr-Oliver Opens New Offices

Dorr-Oliver, Inc., has announced the relocation of their Chicago office in the Merchandise Mart and the opening of a new office in the Midland Bldg., Cleveland. The new Chicago office provides a central location for operations in that territory and the new Cleveland location will allow Dorr-Oliver to better serve engineers and industry in the Lake Erie area.

Huber-Warco Distributors

Huber-Warco, Marion, Ohio, has announced three new distributors for its complete line of graders: Equipment Distributors, Inc., 3708 Venable Ave., Charleston, W. Va.; Gledhill Road Machinery Co., Galion, Ohio; Road Machinery, Inc., Devon, Pa.

Koppers Vice President Named

F. L. Byrom, manager of operations, Tar Products Div., Koppers Co., Inc., has been appointed a divisional vice president and assistant manager of that division. Mr. Byrom succeeds R. R. Holmes, who recently was made vice president and general manager of the division, following the election of Fred C. Foy as president of the company. Mr. Byrom joined Koppers in 1947 as assistant

You have ALWAYS a modern cap lamp with

WHEAT

WHEAT Electric Cap Lamps are service-engineered to *stay* on the job. Wheat design refinements do not obsolete your original lamps—you are not left with "orphans" on your hands that cannot be used along with newer models. *A WHEAT Lamp 20 years old can be charged on the latest automatic Wheat rack.*

● This is the way Wheat responsibility works for the operator . . . another of the reasons why *the Trend is to Wheat!*

Write for the latest Wheat Lamp Bulletin.

The trend is to WHEAT

National Mine Service Company

has the facilities - delivers the goods

564 ALCOA BUILDING, PITTSBURGH 19, PA.

7 PLANTS TO SERVE YOU ALL-STATE DIVISION, Logan, W. Va.; ANTHRACITE DIVISION, Forty Fort, Pa. ASHLAND DIVISION, Ashland, Kentucky; BEMECO DIVISION, Beckley, W. Va.; KY.-VA. DIVISION, Jenkins, Ky.; WESTERN KY. DIVISION, Madisonville, Ky.; WHITEMAN DIVISION, Indiana, Pa.

SEE OUR COAL SHOW EXHIBIT! BOOTH Nos. 2609-11-13 LOWER LAKESIDE HALL

May 16-19, 1955 • CLEVELAND AUDITORIUM

to the general manager of the Tar Products Div., and since 1949 has served as assistant production manager, manager of the division's Follansbee, W. Va., plant, production manager and manager of operations.

Aeroquip Expands Line

Aeroquip Corp. has acquired Marman Products, Inc., Los Angeles, manufacturer of pipe clamps, flex joints and valves. Peter F. Hurst, Aeroquip's president, described the purchase as an important step in the company's program of expansion and diversification. The Marman purchase follows Aeroquip's acquisition in February of the hose line and fittings operations of its former Canadian licensee.

Eriez Buys Richmond Products

Eriez Mfg. Co., Erie, Pa., has purchased the Niagara magnetic-separator business and equipment of Richmond Mfg. Co., Lockport, N. Y., it was announced by R. F. Merwin, Eriez president. Niagara magnetic separators are now being built in Erie and the Eriez Mfg. Co. will handle service and repair parts on Richmond magnets in the field.

Chain Belt Bearing Unit

Chain Belt Co., Milwuakee, Wis., has announced the purchase of 47 acres near Downers Grove, Ill. This new property will enable the company to increase its Shafer Bearing manufacturing capacity and improve service to customers in both the domestic and foreign markets. The Shafer Bearing Div. was acquired by Chain Belt Co. in 1953.

New Plant for Timken

The Timken Roller Bearing Co. has announced plans to construct a $250,000 rock-bit producing facility at its St. Thomas, Ontario, plant. Carbide-insert rock bits will be made in sizes up to 3 in in diameter for the expanding Canadian markets and export trade. Production is expected to start around next September.

Wickwire Spencer Renovates

Complete renovation of Colorado Fuel & Iron Corp.'s Wickwire Spencer Div. plant in Buffalo has been announced by A. F. Franz, president of the corporation. The program involves several million dollars. "The numerous improvements at the Buffalo plant are part of our continuing overall policy of improving operating facilities in the interest of reducing costs and increasing diversification," Mr. Franz said.

Am. Brake Shoe Appoints

John S. Hutchins, president of Ramapo Ajax Div., American Brake Shoe Co., New York, has been named to additional duties as president of the National Bearing Div. Mr. Hutchins joined the sales department of American Brake Shoe in 1925 and has been a vice president of the company since 1946. Named executive vice president of National Bearing Div. is Charles M. Ruprecht, president of the Electro-Alloys Div. since 1953. Paul L. McCulloch, Jr., sales manager of the Electro-Alloys Div. since 1953, succeeds Mr. Ruprecht as division president.

Fairbanks-Morse Shifts Three

John C. Elmburg has been named assistant general sales manager, Fairbanks, Morse & Co., Chicago, Ill. During his 26 yr with the company, Mr. Elmburg has served as technical assistant, field engineer, department manager and manager of the firm's Boston, Atlanta and Portland branches. He succeeds Harry L. Hilleary, who is retiring after 35 yr of service with the company. William F. Wahlenmaier, Electrical Dept. manager since 1954, has been appointed Portland branch manager to succeed Mr. Elmburg.

Koppers Coupling Manager

Theodore W. Chase has been appointed manager of the Coupling Dept., Metal Products Div., Koppers Co., Inc. Prior to joining Koppers, Mr. Chase had been purchasing agent for Pennsylvania Water & Power Co. since 1952.

Twin Coach Buys Davey

Completion of an agreement under which Twin Coach Co. will purchase all the outstanding stock of Davey Compressor Co. has been announced by L. J. Fageol and Paul H. Davey, presidents of the two Kent, Ohio, concerns. A joint statement read: "After careful study, officers and directors of Twin Coach Co. and Davey Compressor Co. have agreed to consolidate the financial assets of the two companies. This will be accomplished by an exchange of stock certificates under which Davey share-

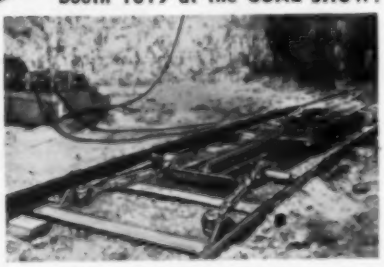
OVER 100 NOLAN PORTA-FEEDERS

NOW IN SERVICE!

TWO MODELS:

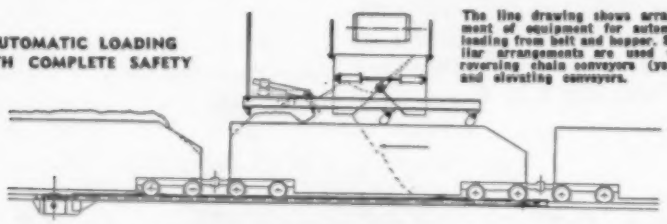
1. Direct Mechanical Drive
2. Hydraulic Cylinder Type Hose Coupled to Remote Power Unit (Shown in illustration at right)

See the PORTA-FEEDER in action in Booth 1619 at the COAL SHOW!



These two Nolan models will help you meet every requirement and condition in spotting cars for loading . . . *and can save you many shift hours per day!* The Porta-Feeder mounts between the rails on top of the track ties, and is secured by rail clamps. No excavation or preliminary foundation work is necessary. There are no ropes or cables. Reciprocating pushing dogs deliver constant forward feeding motion.

AUTOMATIC LOADING WITH COMPLETE SAFETY



The line drawing shows arrangement of equipment for automatic loading from belt and hopper. Similar arrangements are used with reversing chain conveyors (yoyos) and elevating conveyors.

The Nolan Porta-Feeder has been in successful use in many mines for over five years. This modern method of moving cars has been accepted as the most efficient in the industry. Its ease of installation and quick movability recommends its use in any mine.

We will be glad to show you a mine in your vicinity where the Nolan Porta-Feeder is operating. Write us now.

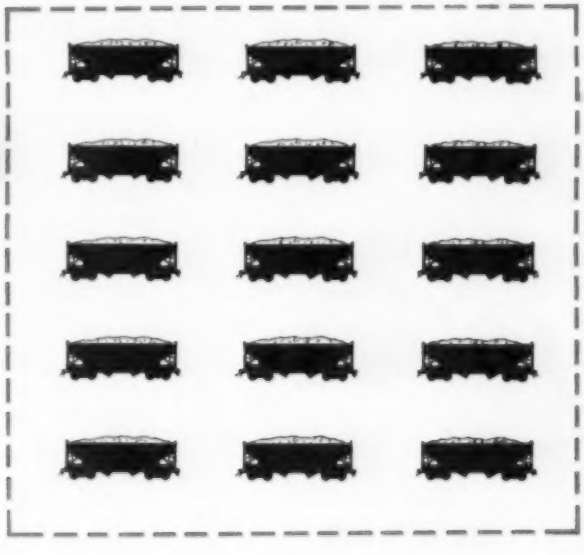
NOLAN

THE NOLAN COMPANY

106 Pennsylvania St. • Bowerston, Ohio

FROM 40 TPH

TO 600 TPH



THE CHANCE PROCESS CLEANS COAL
at minimum cost per ton

Regardless of the amount of coal to be cleaned — as little as 40 tph or as much as 600 tph — there is a Chance Process cone to handle it economically. Preparation plant owners find the Chance Process the most efficient method of cleaning all types of coal. It is not only dependable, but it also offers many other advantages to the mine operator:

HIGH SEPARATING EFFICIENCY—With the Chance Process, there is almost 100% recovery of salable coal. The washing gravity is not affected by fluctuating rates of feed. The efficiency remains constant.

WIDE FLEXIBILITY—Coal is handled at gravities from 1.35 to 1.65, with sizes ranging from 10" to ⅛". A change of gravity can be made in less than five minutes, simply by opening or closing valves.

ECONOMICAL OPERATION—The heavy-duty construction of the Chance Process equipment gives trouble-free performance. The operation is low in cost for it requires the part-time attention of only one man.

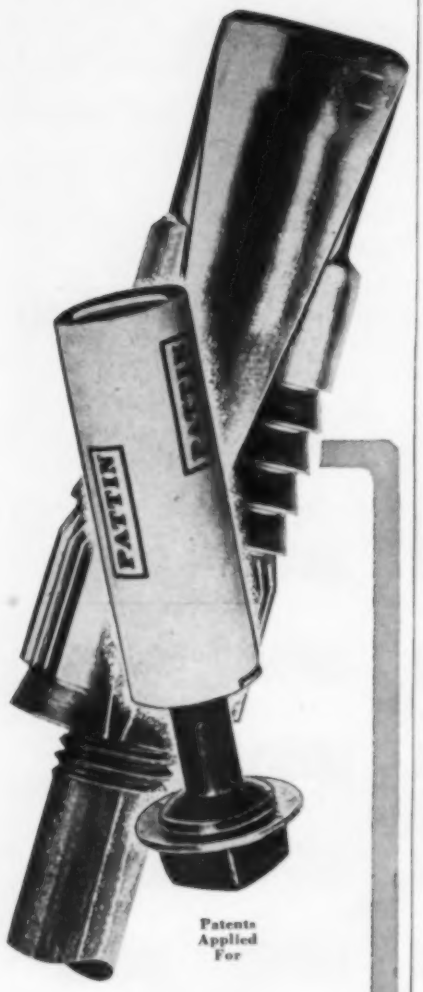
Our engineers will be glad to help you select the most economical unit for your preparation plant.

THE HEART OF THE PREPARATION PLANT®

UNITED ENGINEERS & CONSTRUCTORS INC

NEW YORK 17 PHILADELPHIA 5 CHICAGO 2

WITH A BACKGROUND OF OVER SEVENTY YEARS' EXPERIENCE



Patents Applied For

CHECK WITH YOUR BOLTING CREW

Many time studies and tests made by roof bolting crews on expansion shell load-strength and bolt handling and installation time show that the new PATTIN double expansion shell assembled with bolts with the new self-centering head cut usual handling and installation time up to 30 per cent while providing the strongest known anchorage for the bolts. Have your bolting crews test the PATTIN shells and bolts. Write or phone us — we'll gladly work with you on any bolting tests.

PATTIN
MFG. COMPANY
Marietta, Ohio
Est. 1888

holders will receive Twin Coach stock for their equities. The Davey Compressor Co. will continue to operate with present personnel and management as a wholly-owned subsidiary of Twin Coach Co."

And For Your Information . . .

Four motorized field training units have been placed in service by the Tractor Div., Allis-Chalmers Mfg. Co., Milwaukee, Wis., to bring "at the door" service training on the new Allis-Chalmers diesel engines to the company's industrial dealer service organizations. A unit with two-man crew is assigned to each of the company's industrial sales and service territories, and the training supplements the all-inclusive service instruction Allis-Chalmers provides at its Industrial Training Center, Springfield, Ill.

As part of its program for providing better engineering service in the field, Firth Sterling, Inc., has appointed Carlisle R. Henry as carbide service engineer in its Chicago district, with headquarters in Indianapolis. Mr. Henry joined Firth Sterling after a 19-yr association with the International Harvester Co., where he had been a tool research engineer at its Indianapolis plant.

John R. Burkett has been appointed assistant to the manager of the Explosives Dept., it was announced by L. C. Duncan, general manager, American Cyanamid Co., Organic Chemicals Div. Mr. Burkett joined Cyanamid in 1935, and previously was business manager for dyestuffs and pigments, North American Cyanamid Ltd., Montreal, Canada.

The Lima Electric Motor Co. is expanding its main manufacturing plant at Lima, Ohio, and increasing production facilities there. H. E. Reeder, company president, has announced that construction is under way and is scheduled for completion in about 3 mo.

Syntron Cincinnati Sales Co. has appointed Flavel Nelms district manager for Tennessee, with headquarters in Nashville. Mr. Nelms was formerly with Syntron Cincinnati Sales in Memphis, Tenn.

Harris Hardware & Supply Co., Inc., Kingston, Pa., has been appointed an authorized Carboloy carbide distributor by Carboloy Dept., General Electric Co., Detroit.

U. S. Machine Div., Stewart-Warner Corp., has appointed two new Winkler district sales managers. Edward W. Garrison, Morganfield, Ky., was assigned western Kentucky and parts of Tennessee and Missouri. B. Robert Ozer, formerly of Philadelphia, has taken over the Pittsburgh territory. Both held Winkler dealer franchises.

Clark Equipment Co. has named two new distributors in Missouri and North Dakota for its Michigan line of tractor shovels and excavator cranes, it was announced by Clarence E. Killebrew, Clark vice president. The distributors are: Charles Dunn Machinery, Inc., 1915 Locust St., Kansas City, Mo.; and Mid-

Be Sure to Visit Booth 617 at the Coal Show

NEWCOMER CARBIDE MINING TOOLS *for greater production... EVERYWHERE!*

NEWCOMER CARBIDE and CARBIDE MINING TOOLS are made in one plant specializing in Controlled Quality Carbide and Carbide Tools.

NP MACHINE BITS

Designed with a durable alloy steel shank, heat treated to withstand considerable abuse, and properly shaped NP Controlled Quality Carbide Tips that give maximum cutting with minimum power consumption.

NP DRILL BITS

The drill with the twist that counts . . . developed through intensive research to commercially produce a drill head combining the exceptional wear resistance of NP Cemented carbides with the free-cutting, non-clogging features of the old style twisted steel bit.

NP ROOF DRILL BITS

Extremely satisfactory in use even under abnormal conditions. Available in both slotted and solid spade types. Tipped with NP Controlled Quality Carbide, these bits assure faster drilling with less feed pressure than normally required.

Send today for Mining Tool Catalog MT-553

NEWCOMER PRODUCTS, INC.
Latrobe, Pa.

General Sales Office:
512 Franklin Ave., Pittsburgh 21, Pa.

Other sales offices in principal mining areas.

According to authentic records*. . .

Here's The Country's Fastest Growing Method of Mining...

LONG PIGGYBACK® Conveyor System...

*Report on 1954 sales of mining equipment

There are, of course, good reasons why LONG Piggyback‡ conveyor mining is getting more popular every day. For instance, this exclusive LONG development loads and moves coal from the face continuously *with no waiting for "stop-and-go" transportation.* That means less down time, more tons per man-shift, higher total tonnages, and lower operating costs.

When you consider these proved advantages plus the fact that the initial investment for Piggyback mining is surprisingly low, it's easy to understand why more and more mines are switching to this low-maintenance, continuous flow conveyor system.

If you would like more information on today's fastest growing method of mining, we'll be glad to supply facts and figures—without obligation.

Want details or a demonstration? Write us today.

‡Trade Mark

The LONG Company
OAK HILL, W. VA.

America's Foremost Manufacturer of Chain Conveyor Equipment!

Here's the latest development in roof bolting

IT'S REPUBLIC'S FORGED WEDGE NUT AND SHELL ASSEMBLY. This new development by Republic retains all the well-known anchoring qualities of the bail-type shell assembly. Successful installation in soft rock has proved just as easy as installation of the popular expansion sleeve shell assembly. Use of the Wedge Nut and Shell Assembly permits recovery of the bolt. Protruding threads below the bearing plate, so often a hazard in ceiling areas less than 5 feet high, have been eliminated.

Republic's new assembly is designed for use with either a ¾-inch mild steel bolt or ¼-inch and ⅝-inch high carbon steel bolts. Both sizes have square heads, washer forged under head and are unchamfered for snug wrenching.

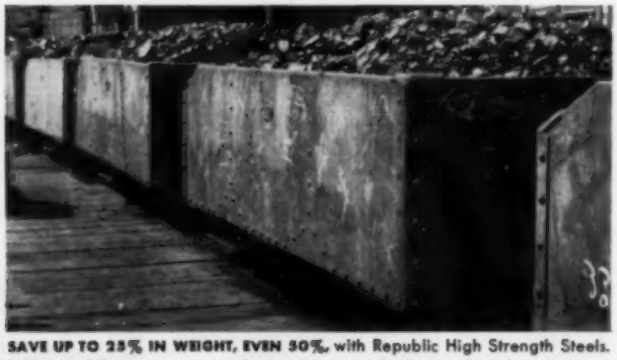
Know your steelmaker—this is more important than ever with the present trend to widespread use of ⅝-inch high carbon steel bolts. Putting a "big head"—heavier and larger than a standard head—on a ⅝-inch high carbon steel bolt requires know-how. Steel used in these bolts must be able to withstand the torque applied during wrenching.

Republic's Bolt and Nut Division has the skill, the equipment, the experience—over 100 years—needed to produce mine roof bolts of the highest quality and dependability from steel of its own manufacture. Quality is controlled at every stage of production—from ore to finished product.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

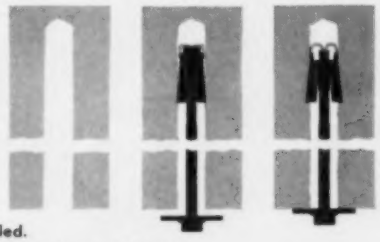
REPUBLIC FLEXIBLE PLASTIC PIPE licks the problem of handling corrosive mine waters. Made of chemically inert polyethylene, it is not damaged by acids, alkalies, metallic salts or other corrosive wastes. Easy to handle, it can be made up quickly by one man. Only tools necessary are screwdriver, knife or handsaw. Republic Flexible reduces installation time by 75%. Eliminates continual replacement of corroded-out lines.



SAVE UP TO 25% IN WEIGHT, EVEN 50%, with Republic High Strength Steels. When mobile equipment, such as mine cars, is designed and engineered from the beginning to take full advantage of the qualities of Republic High Strength Steels, weight savings up to 50% are possible. The combination of strength, toughness and resistance to corrosion means longer life for equipment, particularly in severe, heavy abusive service.

Assembling roof bolt for installation.

How to install



1. Hole is drilled.
2. Assembled bolt is inserted in hole.
3. As bolt is tightened, the wedge nut is forced down into forged shell. Deep, sharp serrations on shell surfaces bite into hole sides as shell expands.

EFFECTIVE ROOF BOLTING is largely determined by the strength of the anchor. Republic's Forged Wedge Nut and Shell Assembly provides a stronger anchor than the expansion sleeve type. Greater total expansion is obtained. More shell area is in contact with the hole wall. This new assembly permits reclaiming of bolts and roof plates.

NEW BOOKLET tells the complete story of Republic's new Wedge Nut and Shell Assembly. Plus information on materials, packaging, other assemblies, how to order. The coupon will bring your copy.

Roof bolt lengths are stamped on all products. High carbon steel is indicated by the stamping R40. Republic can ship roof bolts, plates and shells assembledorseparately as requested.

NEW WAY TO FASTEN STRUCTURES, permanently, economically, is with Republic High Strength Structural Bolts. Replaces field riveting. Bolts can do anything a rivet can do, better, quicker and at lower installed cost. Made in accordance with ASTM Spec. A325. Bolts are marked for easy identification to conform to Spec. for Assembly of Structural Joints, 2-27-54, Research Council on Riveted and Bolted Construction.

REPUBLIC STEEL CORPORATION
3124 East 45th Street
Cleveland 27, Ohio

REPUBLIC STEEL

☐ Please send new booklet on Mine Roof Bolts.

Please send more information on:

☐ Plastic Pipe ☐ High Strength Steels

☐ High Strength Bolts

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

E-8466

sell
more
btu's...
with
BEE-ZEE!

BEE-ZEE Tri-Rod

BEE-ZEE Round Rod

BEE-ZEE Grizzly Rod

BEE-ZEE Grizzly Rod with protective skid rod

Naturally your customers expect low moisture content in your coal—they know that every pound of water you "sell" them represents 15,000 lost BTU's. And BTU's are what they're buying.

Sell more BTU's by dewatering over Bee-Zee Screens. Efficiently shaped top rods and round tie rods provide surfaces that water can't cling to. There are no pockets or corners—no clogging or blinding to hold back water.

So find out all about the screens that *make you money*—Bee-Zee. They're 100% stainless steel... won't rust or corrode and are stubborn about wearing out. They are welded on highly accurate electronic equipment and can be fitted to any screening machinery you operate. Rod shapes and spacing are selected for the results you're after.

Pick up the phone, dictate a letter or wire us for complete facts. Do it now, today, while it's on your mind.

CALL US COLLECT—GALESBURG, ILL. 4397
BIXBY-ZIMMER ENGINEERING CO
155 ABINGDON STREET, GALESBURG, ILLINOIS

BIXBY-ZIMMER Engineering Co.

west Equipment Co., 501 N. Fourth St., Fargo, N. D., and 1400 Main St., Bismarck, N. D.

Link-Belt Co. has appointed Dwight H. Renfrew chief engineer, and William A. Morley general superintendent of its Philadelphia plant. Since 1944, Mr. Renfrew has been general superintendent of Philadelphia operations and Mr. Morley has been superintendent of Link-Belt's Olney foundry in that city.

George C. Gregson, plant manager of the wire rope divisions of American Chain & Cable Co. for the past 30 yr, has retired. He has been succeeded by Ernest S. Wellhofer, who will take over his duties at the company's Wilkes-Barre, Pa., and Houston, Texas, plants. Charles H. Layton replaces Mr. Wellhofer as chief wire rope engineer.

Lincoln Electric Co., Cleveland, has named L. K. Stringham vice president in charge of engineering. He has been chief engineer for the company since 1951. George Landis, who has been the engineering vice president, was appointed vice president in charge of research.

Five Atomic Power Plants Proposed to AEC

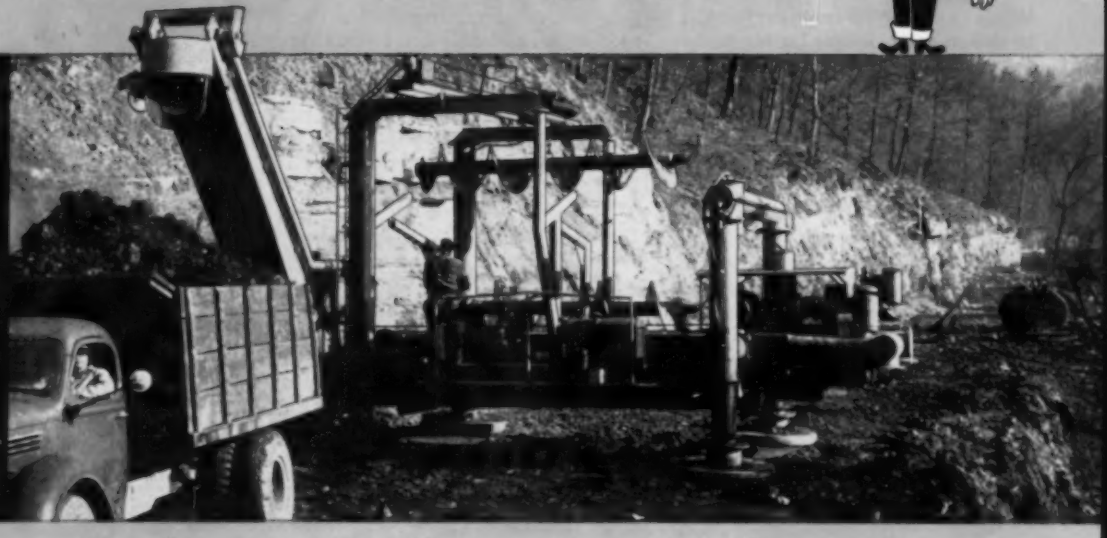
The Atomic Energy Commission announced April 7 that it had received five proposals from industry for the construction of nuclear power plants. Four of the proposals, submitted under the AEC's power demonstration reactor program, ask for government financing of about 10 to 20% of the capital cost.

These four are as follows: (1) boiling water reactor plant, 180,000-kw capacity, to be completed in 1960 near Chicago, proposed by Nuclear Power Group (American Gas & Electric Service Corp., New York; Bechtel Corp., San Francisco; Commonwealth Edison Co., Chicago; Pacific Gas & Electric Co., San Francisco; and Union Electric Co., St. Louis); (2) light water moderated and cooled reactor plant, 100,000-kw capacity, to be completed late in 1957 in western Massachusetts, proposed by Yankee Atomic Electric Co. (12 New England utilities); (3) fast breeder reactor plant, 100,000-kw capacity, to be completed in late 1958 near Detroit, proposed by Central Hudson Gas & Electric Corp., Cincinnati Gas & Electric Corp., Consumers Power Co., (Mich.), Delaware Power & Light Co., Detroit Edison Co., Long Island Lighting Co., Philadelphia Electric Co., Rochester Gas & Electric Co., and Toledo Edison Co.; (4) sodium graphite reactor plant, 75,000-kw capacity, to be completed in Nebraska in 1959, proposed by Consumers Public Power District of Columbus.

In the fifth proposal, Consolidated Edison Co., New York, has applied to the AEC for a license to build and operate "entirely with private capital" a nuclear power plant with a capacity of 250,000 kw along the Hudson River. The plant, to cost about $55 million, would take about 5 yr to build.

SMALL but MIGHTY!

The all new



Compton Budget Model 28 Coal Auger

Ideal for narrow pits and short benches

Here it is! The mighty mite of the Compton Coal Auger family—Model 28—designed, like its big brothers, to raise production figures and cut operating costs—This new machine will produce up to 50 tons per hour. Only 28 feet long, light weight and easily moved from pit to pit with optional available tail wheel assembly, this Compton Coal Auger enables a 3 man crew to efficiently handle tough mining assignments in pits and/or benches as small as 30 feet—augering to a depth of 150 feet.

Model 28 incorporates many of the time-proven features found only in Compton Coal Augers:

1. Model 28 with all size cutting heads drills coal within 4¾″ of the bottom—assuring maximum recovery.
2. Easily accessible auger sections racked on the frame.
3. Elevating conveyor is integral part of the machine.
4. Hydraulic jack legs (with self-leveling pontoons) allow drilling up to 150 feet without misalignment.
5. Single or vertical overlapping holes can be drilled for greater recovery.
6. Easy to move along working face of highwall.

It will pay you to look into the advantages of the Compton Coal Auger. A Compton representative will help you review your property for the proper auger application.

GENERAL SPECIFICATIONS
MODEL 28

Length: 28 feet
Weight: Approx. 25 tons
Carries 12—12½ ft. auger sections
Required pit width: 30 ft. min.
Power: 175 hp Diesel engine
Hydraulic Frame Jack Lift: 54 inch
Auger Diameter: 44″ to 28″
Max. Drilling Depth: 150 feet

Cutting Head: Compton non-clogging type with built-in spider bearing assembly provides straighter drilling with less frictional drag.

CLEVELAND COAL SHOW
SEE THIS MACHINE
MAY 16-19 LOT 550

Compton, Inc.
ORIGINATORS OF COMPTON LUMP RECOVERY HEADS

VISIT BOOTH 329
CLEVELAND COAL SHOW
MAY 16-19

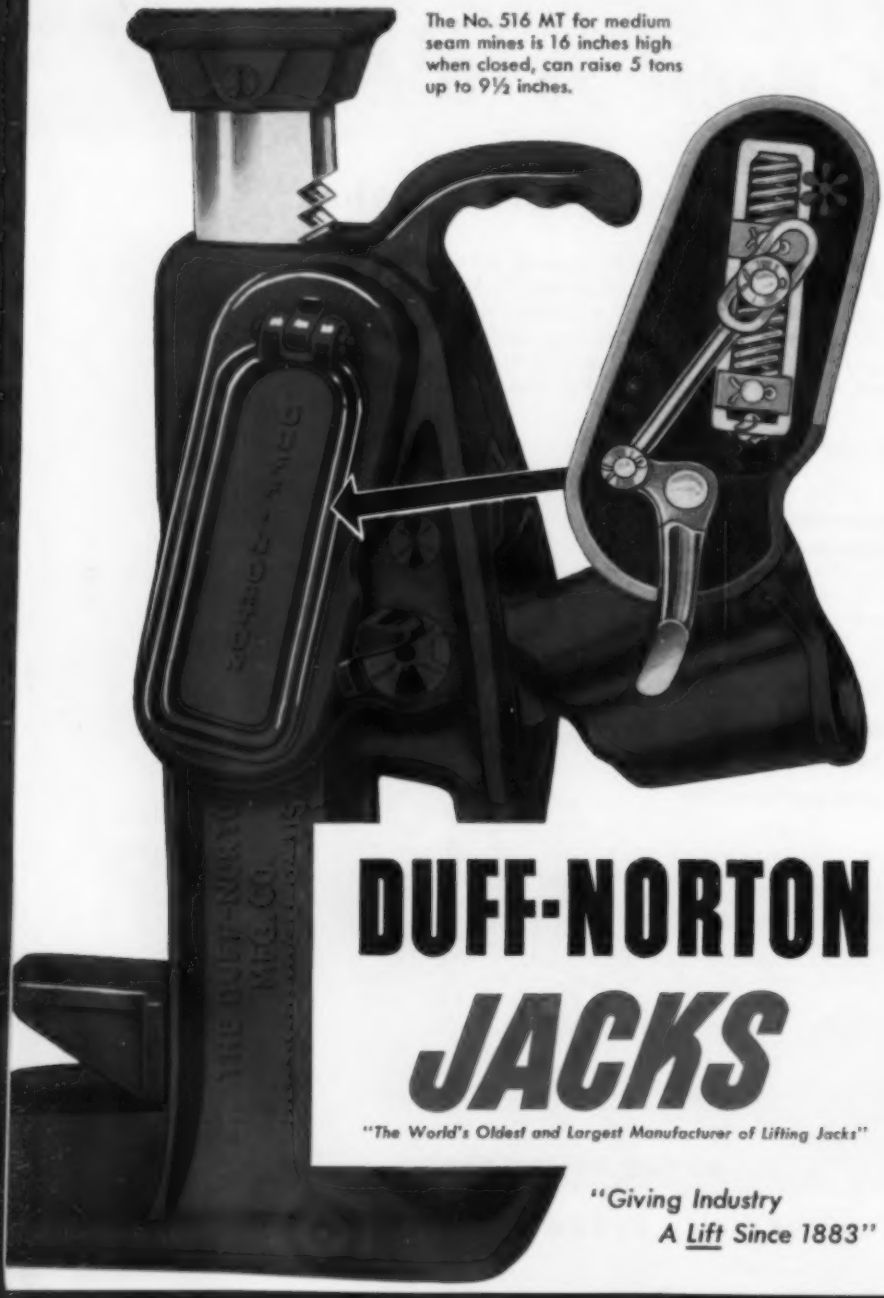
BOX 1946 TELEPHONE 4-6384 • CLARKSBURG, WEST VIRGINIA

Why This Special Mine Jack Will Give Longer, Trouble-Free Service

When Duff-Norton engineers set out to design safer, longer lasting jacks for men who work in and around coal mines, they discovered one startling fact—about 90% of jack maintenance was in replacing worn springs in the mechanism that controls the jack's raising or lowering action. Result? All Duff-Norton mining jacks are equipped with a patented,* adjustable spring mechanism which assures positive engagement of rack teeth. The spring's tension can be easily adjusted with a screw driver without removing any part of the jack. Should the spring eventually lose its resiliency, there's no need to send the jack to the repair shop. A new, complete spring mechanism assembly can be quickly installed by anyone in a matter of minutes, making the jack as good as new! In fact, as a special service, Duff-Norton distributors carry in stock extra spring mechanisms for all Duff-Norton ratchet lowering jacks.

Ask your local distributor or write the world's oldest and largest manufacturer of lifting jacks for a copy of *"A Handy Guide for Selecting Duff-Norton Mine Jacks."* This colorful, illustrated booklet is full of useful information about all kinds of jacks for coal men. Write for bulletin AD10-J to Duff-Norton Company, P.O. Box 1889, Pittsburgh 30, Pa.

The No. 516 MT for medium seam mines is 16 inches high when closed, can raise 5 tons up to 9½ inches.



DUFF-NORTON

JACKS

"The World's Oldest and Largest Manufacturer of Lifting Jacks"

"Giving Industry A Lift Since 1883"

Synthetic Fuels Advance

Achievements during the 10th year of USBM research under the Synthetic Liquid Fuels Act were reported to Congress by Secretary of the Interior Douglas McKay April 17. Highlights of the report, covering 1954, are:

1. Installation by a chemical manufacturer of commercial-scale equipment for gasifying coal at atmospheric pressure. This equipment was developed on the basis of experiments performed at the bureau's Morgantown, W.Va., laboratories.

2. Resumption of experiments at Gorgas, Ala., in cooperation with private firms, to evaluate a hydraulic method of fracturing a coal seam so that it can be gasified underground.

3. Advancement of work at Bruceton, Pa., on a single-step process for making oil by the hydrogenation of coal, which may replace the present two-step process.

4. Continued operation of a 150-300-tpd gas combustion retort for oil shale at Rifle, Col. During 1954 this retort operated 59 days without serious difficulty.

5. Progress in studies at Laramie, Wyo., on the fundamental structure of oil shale.

NEWS BRIEFS . . . From p 146

Sinclair Buys Crowe Coal

The Sinclair Coal Co., Kansas City, Mo., has purchased all the stock of the Crowe Coal Co., Clinton, Mo., it was announced March 24 by L. Russell Kelce, Sinclair president. W. C. Shanks, president, Crowe Coal Co., will continue to head the wholly-owned Sinclair subsidiary and the same personnel will be retained. Crowe Coal has been operating since 1889 and the Clinton mine produces about 400,000 tons a yr.

Glen Alden to Broaden Scope

Stockholders of Glen Alden Coal Co. were scheduled April 26 to vote on a change in company name and a broadening of the corporate purpose clause. The name change would eliminate "Coal" from the present company name. Proposed broadening of company operations was in line with a recent announcement "that anthracite has definite advantages in the metallurgical and chemical fields, and, with proper merchandising, in the home-heating field." It is known that Glen Alden has made tentative plans for erecting a new plant along the Susquehanna River, near Plymouth, for the manufacture of by-products from anthracite. Glen Alden will continue to stress anthracite as the community's basic industry, it was said. Recently the company announced plans to spend $3 million for improvements in mine mechanization and breaker modernization during the 1955-56 period.

EATON AXLES

Proven Performance in Every Type and Size

The rugged housing used in famous Eaton 2-Speeds is also used for Eaton single-reduction and double-reduction axles—the three heads are interchangeable.

Behind every Eaton Axle there is almost a half-century of truck axle manufacturing experience. The advanced engineering and quality construction which have made Eaton 2-Speeds famous for stamina and low-cost hauling are also found in Eaton single-reduction, double-reduction, tandem drive axles, and front axles. In more than two million motor trucks, Eaton experience and engineering know-how are reflected in outstanding performance records, minimum hauling costs, and longer vehicle life.

EATON — **AXLE DIVISION**
MANUFACTURING COMPANY
CLEVELAND, OHIO

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

VICTAULIC METHOD OF PIPING

VICTAULIC COUPLINGS

Styles 77, 77-D for standard applications. Simple, fast to install—sturdy and reliable. Sizes ¾" to 30". Style 75 Light-Weight Couplings for light duty applications. Sizes 2", 3", 4". Additional styles for cast iron, plastic and other pipes. Sizes through 60".

VICTAULIC FULL-FLOW FITTINGS

Complete line of Elbows, Tees, Reducers, Laterals, etc.—to fit all Victaulic Couplings. Streamlined for top efficiency, easy to install. Sizes ¾" to 12".

VIC-GROOVER TOOLS

Handy, on-the-job grooving tools that do the work in half the time. Light weight, easy to handle—operate manually or from any power drive. Automatic groove position and depth. Sizes ¾" to 8".

ROUST-A-BOUT COUPLINGS

Style 99 for plain or beveled end pipe. Best engineered, most useful plain end joint on the market. Simple, husky — easy and fast to install. Takes strong bull-dog grip on pipe. Sizes 2" to 8".

VICTAULIC SNAP-JOINTS

Victaulic's new boltless, speed coupling. — Style 78 — hinged into one assembly. Hand-locks for time and dollar savings. Sizes 1", 1¼", 2", 3", 4".

EASIEST WAY TO MAKE ENDS MEET

Promptly available from distributor stocks coast-to-coast. Write for NEW Victaulic Catalog-Manual 55-5A

VICTAULIC COMPANY OF AMERICA

P. O. Box 509 • Elizabeth, N. J.

Kentucky Coal Firm Faces Wage Violation Charge

Secretary of Labor Mitchell has asked the U. S. District Court for an order prohibiting Clay M. Bishop, Manchester, Ky., doing business as New Hyden Coal Co., from violating the minimum-wage and other provisions of the Federal Fair Labor Standards Act. It is claimed that about 24 employees of the firm had been paid less than the wage rates required by the federal law. A motion for preliminary injunction is scheduled for hearing May 30 at Lexington, Ky.

W. Va. Safety Group Formed

The Central West Virginia Council of the Holmes Safety Association was formed recently in Clarksburg, W. Va., at a meeting attended by officials and employees of producing companies, the UMWA, the State Department of Mines and the federal Bureau of Mines. Eleven companies, with 13 mines and 1,702 men, form the council which is the first in northern West Virginia. It is composed of 13 chapters and headed by A. B. Ord, Barnes-Dawson Coal Co. Along with other safety activities, participating mines will compete monthly for safety banners.

Princess Elkhorn to Award Five Scholarships

Princess Elkhorn Coal Co., David, Ky., will again offer five college scholarships this spring following a program established in 1944. Two scholarships are to be granted to sons and two to daughters of company employees. The fifth scholarship is to be awarded to any graduating senior in Floyd or Johnson County, Kentucky. During the 11 yr the program has been in effect, 41 young men and women have attended college with Princess Elkhorn grants.

Anthracite Working Time Increases 12.4% in 1954

Working time in the anthracite industry rose 12.4% from 167.3 days in 1953 to 188.1 in 1954, the Anthracite Institute recently reported. Number of men employed in the industry last year, however, dropped 32.9% from 1953. In 1954, the institute said, number of men employed in union production totaled 34,050, as compared to 50,716 in 1953. Industry output in 1954 was estimated at 136,500 tons a day.

Coal Organization Acts To Develop Colorado Uranium

Sinclair & Hildreth Mines, Inc., has opened offices in the First National Bank, Gunnison, Colo., to engage in the local uranium mining program, according to reports. The concern, affiliated with Sinclair Coal, has already moved in a full complement of research instruments ranging from microscopes to the latest in field equipment for locating uranium and plotting the direction of veins. Mike Hildreth, an associate of the company, said the company will engage in uranium mining and mining research.

United States Rubber Company announces
the perfection of a new shuttle car tire.

2,000,000 Tons Mined Without Tire Downtime!

Sketch of shuttle car in 35" Elkhorn #3 seam

In 1951, at the request of leading coal mine operators, U. S. Royal engineers began development of a tire which *would not fail* when least expected . . . would not cause stoppage or loss of coal production. Now comes the result of their effort: the perfected U. S. Royal Demountable Mine Cushion.

How well these engineers succeeded is proved by the fact that in *three years* of grueling on-the-job tests, new U. S. Royal Mine Cushions have moved over two-million tons of coal without a single ton of production loss due to tire failure.

Only U.S. Royal Mine Cushion offers these exclusive features:

GREATER CAR CLEARANCE. Reduced overall diameter of the Mine Cushion generally permits greater car clearance in low-seam coal.

CUSHIONED RIDE. Thanks to U. S. Royal Mine Cushion's exclusive dual-stock construction of specially compounded rubber, ride characteristics are superior to tires in present use.

DOUBLES SERVICE LIFE. In exhaustive comparisons, the service life of U. S. Royal Mine Cushions averaged better than twice that of other tires used in shuttle-car service.

LESS DRAG, GREATER SPEEDS. U. S. Royal Mine Cushions have less rolling resistance, allow 25% higher vehicle speeds, boost production efficiency.

HIGHER LOAD CAPACITY. Load rating for 7.00-15 pneumatic is 4,350 lbs.; rating for U. S. Royal Mine Cushion of comparable size, 6,650 lbs.—an increase of over 50%!

EASY CONVERSION. Simple, bolt-on rim adapts to shuttle-car wheels. Unique demountable feature makes changing tire a matter of minutes.

U. S. Royal Demountable Mine Cushions cost no more. Find out how easily you can change over to these longer-lasting, trouble-free mining tires. Write Industrial Tire Department, UNITED STATES RUBBER COMPANY, Rockefeller Center, New York 20, New York.

NEW U.S. ROYAL Demountable MINE CUSHION

Coal Age in September

MINING GUIDEBOOK AND

. . . a *new* COAL AGE

For the first time, coal mining operating officials will have in one place, under one cover, fundamental information on every phase of mining. *What's being done* to cut costs, raise product quality and promote safety.

***Why it's being done* and *how* it's accomplished.**

A source of helpful "know-how" basic principles.

The MINING GUIDEBOOK will contain six editorial sections — six Guidebooks — each complete in itself for convenient reference.

- ★ Deep Mining Guidebook
- ★ Strip Mining Guidebook
- ★ Preparation Guidebook
- ★ Maintenance Guidebook
- ★ Supply Service Guidebook
- ★ Safety Guidebook

presents the

BUYING DIRECTORY ISSUE

reader service

And, in addition, a BUYING DIRECTORY of equipment, services and materials generally used by the coal mining industry. Arranged by products and including trade names, manufacturers names and addresses, the BUYING DIRECTORY will help COAL AGE readers quickly locate sources of supplies. It will be in the same issue, under the same cover.

And there will be a reference to all advertising pages in the product listing to help COAL AGE readers obtain more detailed information on products or services.

The COAL AGE MINING GUIDEBOOK AND BUYING DIRECTORY issue will be mailed to COAL AGE subscribers, automatically, as a new additional subscription service. Plan now to receive your personal copy in September.

GENERAL INDEX

THE COAL AGE MINING GUIDEBOOK and BUYING DIRECTORY ISSUE

1. Deep Mining

Opening and Development
Mining and Loading
Face Preparation
Roof Control
Transportation
Power
Ventilation
Pumping and Drainage

2. Strip Mining

Preparing for Operation
Overburden Preparation
Stripping
Coal Loading
Transportation
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3. Preparation

Raw-Coal Storage and Handling
Cleaning
Clean-Coal Sizing and Loading
Dewatering and Drying
Refuse Disposal
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4. Maintenance

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Shops and Practice
Materials

5. Supply Service

Control and Purchase
Receipt and Handling
Distribution
Waste Prevention

6. Safety

Organization
Building Safety Spirit
Eliminating Physical Hazards

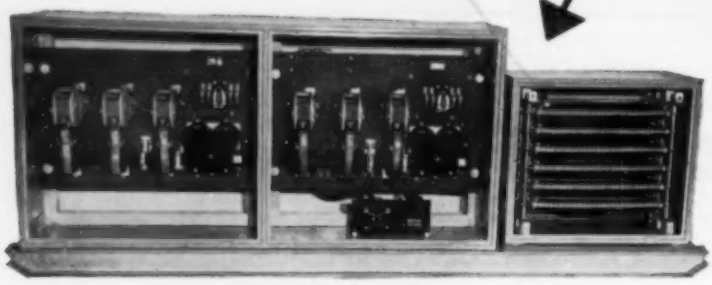
Buying Directory

Equipment, Services and Materials

Use ENSIGN!

SAFE, DEPENDABLE CONTROLS

for Underground Belt Conveyors

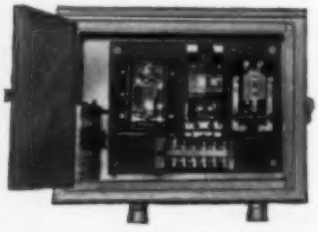


ENSIGN REDUCED VOLTAGE STARTER

Illustrated is Ensign's 220 Volt A.C., 125 HP Starter. It has non-reversing, two-point acceleration and dust-tight enclosure. Over-all height is only 36"—designed for underground mine applications where head room is limited. Ensign Starters are available in A.C. or D.C. with dust-tight or explosion-tested enclosures.

ENSIGNEER SAFETY CONTROL FOR BELT CONVEYOR SYSTEMS

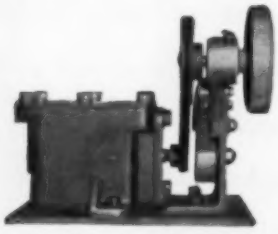
Consists of switch control and two bare contact wires stretched along conveyor line. Complete conveyor can be stopped and started at any point along line by pressing the two-low-voltage wires together. Time relay allows motor to stop completely before it can be restarted.



Ensigneer Bulletin No. 1125

ENSIGN CENTRIFUGAL SWITCH PROTECTS YOUR BELTS

The watchdog of your conveyor line. These centrifugal switches are located one to each section of belt. They prevent jams and damage from belt slippage. Allow sequence operation of multiple conveyors including shaker or chain conveyors feeding onto belt conveyors. Made with dust-tight or explosion-tested enclosure.



Centrifugal Switch Bulletin No. 1101—explosion tested

ENSIGN ELECTRIC AND MANUFACTURING CO.

914 Adams Avenue Huntington 4, W.Va.

VISIT US AT THE COAL SHOW

Booths 2758-60-62

Rates on Great Lakes Coal Railroads to Restore Higher

Rollback of rate reductions on fine coals moving to the Great Lakes for transshipment has been decided upon by the Eastern Traffic Executives Association and the Indiana Coal & Coke Committee. The new rates will become effective June 1. Similar action was expected by the Western Trunk Lines which were scheduled to meet on the matter April 5. The coal industry vigorously opposed the decision by the railroads to erase the rate reductions voluntarily granted less than a year ago. More than 250 representatives of the coal shippers and receivers had appeared in Chicago on March 10 to protest the railroads' announced plans.

Natural Gas Prices May Cut Use by Northeast Utilities

Natural gas may be priced out of the Northeastern utility field because of disorderly and unpredictable rate increases, the House Interstate and Foreign Commerce Committee was told April 14 during hearings on a bill to deprive the FPC of authority to regulate natural gas rates at the wellhead. Randall J. LeBoeuf, Jr., spokesman for the Consolidated Edison Co. of New York and 13 other utilities in the area, also reported that Con Edison was considering the possibility of substituting other fuels for natural gas in the making of manufactured gas. Mr. LeBoeuf blamed "escalator" and other clauses that permit pipe line companies to pass along rate rises made at the wellhead and said that since 1951 the rate had jumped from 25 to 32c per Mcf and that another increase, probably to 36c, was in prospect.

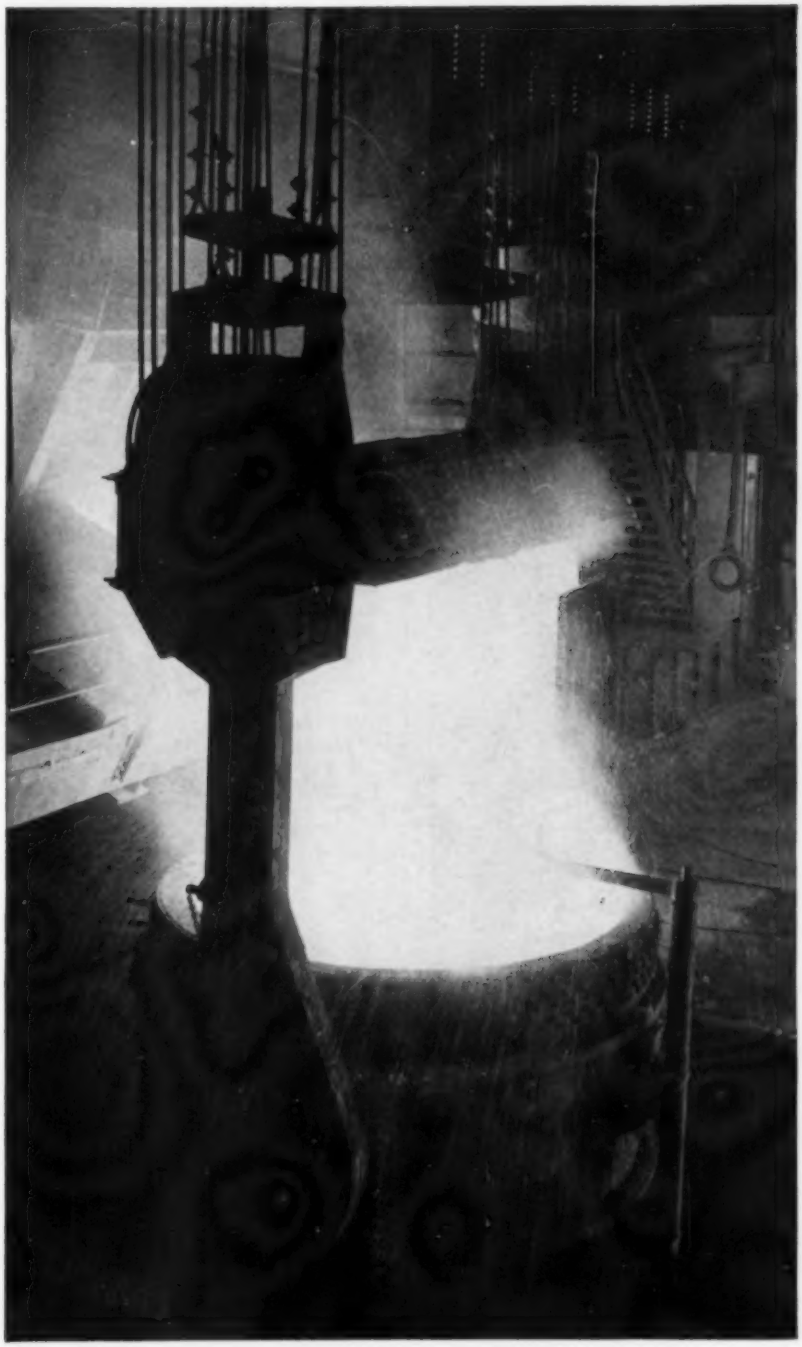
Ky. Miners Disqualified For Jobless Pay

The Kentucky Unemployment Compensation Commission, Frankfort, Ky., ruled 2 to 1 April 13 that employees of Marlowe Coal Co.'s Defiance and Stoker mines in the Hazard field were not entitled to jobless pay benefits. The ruling reversed an earlier decision by a department referee. The referee had ruled that some 200 miners employed at the two mines were thrown out of work last May 31 as a result of a company lockout. The commission majority, however, held that the miners were jobless because of a bonafide labor dispute and hence were ineligible for unemployment benefits. Similar situations arising in the future will be guided by the decision, Commissioner Barnes said. A year ago the Marlowe Co. notified the UMWA that union contracts at the Defiance and Stoker mines would be cancelled because it was impossible to continue profitable operations under them. In testimony before the referee, the company contended that it had lost $15,000 at one mine and $17,000 at the other in the 5 mo prior to cancellation of the contract.

Air Pollution Group Meets

The Air Pollution Control Association will hold its 47th and largest annual

We make our own fine alloy steel — and make it nickel-rich — to make TIMKEN® bearings tougher



NICKEL makes steel tougher. So, our steel-making specialists don't skimp on nickel in the fine alloy steel we make for Timken® tapered roller bearings. They use exactly the right amount of nickel to give these bearings the toughness they need to withstand shock and last longer. Exacting quantities of chromium or molybdenum or both guarantee uniform hardness. By using the steel industry's first direct-reading spectrometer, we exercise hairline control of each element at the precise instant of tapping the furnace.

Rolling, annealing, and cooling are done with the same meticulous care. And every race and roller that goes into a Timken bearing is precision case-carburized to give it a hard, wear-resistant surface over a tough, shock-resistant core.

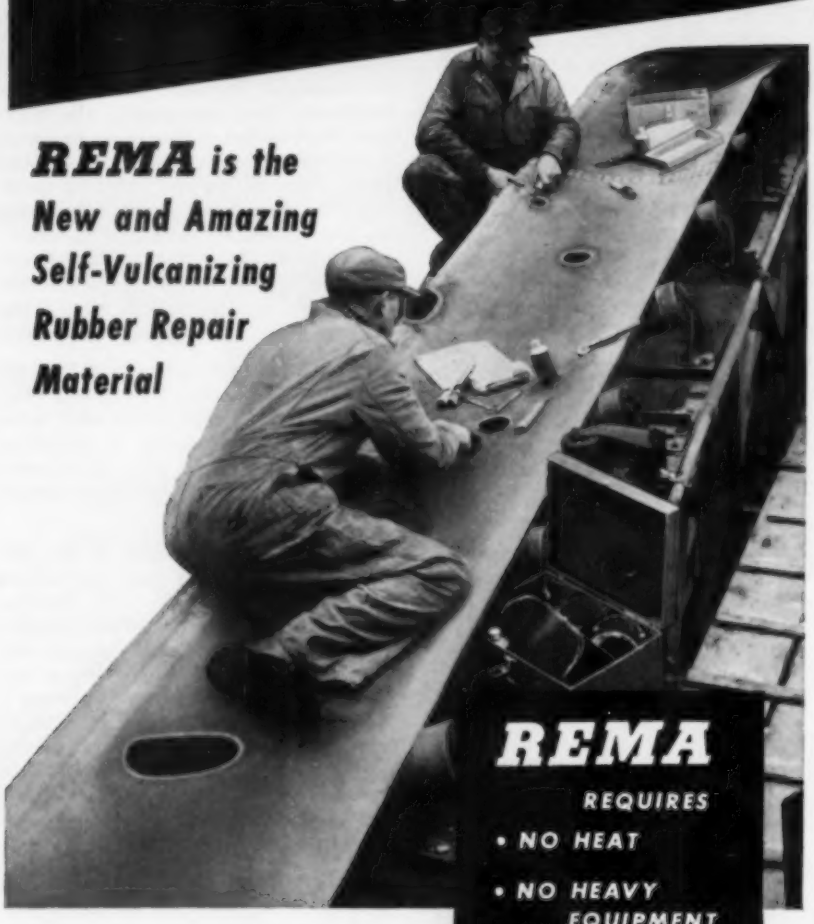
We've been specializing in the production of fine alloy steel for almost forty years. We're the only bearing manufacturer in the country that makes its own steel, because it's the only way we can make sure the quality of our bearing steel is just the way we want it. Steel is the heart of the bearing. That's why we insist on controlling bearing quality *every* step of the way—from melt shop to final bearing inspection. And that's why we don't skimp on the use of nickel.

To be absolutely sure of the highest performance standards in the equipment you build or buy, always specify Timken tapered roller bearings. They are made from seamless tubing or forgings by the most modern processes, under strict control. Only Timken bearings roll so true, have such quality thru-and-thru. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

Only **TIMKEN**® bearings roll so true, have such quality thru-and-thru

Use REMA to add years of life to your Belts


REMA is the New and Amazing Self-Vulcanizing Rubber Repair Material
REMA
REQUIRES
• NO HEAT
• NO HEAVY EQUIPMENT
• NO CURING TIME DELAY

▼ REMA is not just another cold patch. REMA is vulcanization by chemical process. The repaired area is sealed with an abrasive resistant cover stock patch. No heat or heavy vulcanizing equipment required. Here's the astonishing advantage —*when repair work is completed belts may be returned to service immediately.*

▼ REMA seals out moisture, reduces mildew, rot and deterioration —the great enemies of conveyor belts. Your own maintenance man can quickly repair your belts—it doesn't take a skilled belt mechanic to use REMA.

▼ Used for repair of all types of damaged spots, edge wear and for covering metallic joints. Available in introductory kits or parts separately.

Order from your Flexco-Alligator distributor.

Write for Folder No. R4

Flexible Steel Lacing Co., 4638 Lexington St., Chicago 44, Ill.

REMA SELF-VULCANIZING RUBBER REPAIR MATERIALS

meeting in Detroit May 22-26. Air pollution control experts from the United States and Canada are to report on the latest findings in smoke abatement, air pollution measurements, odor control and new developments in abatement equipment. Membership in the national association includes representatives from industry, trade associations, educational institutions, and local, state and national groups.

Company Earning Reports

Westmoreland Coal Co.—Year to Dec. 31, 1954, net loss of $379,933, based on coal sales of $4,741,210, compared to a net income of $133,488 on coal sales of $8,244,206 in 1953.

Island Creek Coal Co.—Year to Dec. 31, 1954, net profit of $1,757,715, equal to $1.35 per share, compared to $1,511,563, or $1.14 per share in 1953.

Pond Creek Pocahontas Co.—Year to Dec. 31, 1954, net profit of $1,109,659, equal to $3.27 per share, compared to $1,483,473, or $4.37 a share in 1953.

Clinchfield Coal Corp. and subsidiaries—Year to Dec. 31, 1954, net income of $1,085,816, equal to $1.40 per share, compared to $1,383,224, or $1.78 per share in 1953.

Ayrshire Collieries Corp. and subsidiaries—Quarter to March 31, 1955, net income of $710,059, or $1.25 a share, compared to $464,240, or 82c a share during the first quarter, 1954. Nine months to March 31, 1955, net income of $1,435,154, or $2.52 a share, compared with $1,102,665, or $1.94 a share for the same period last year.

EG&FA Cites Safety Gains

Seven mines and 35 mine workers in the Eastern Gas & Fuel Associates organization have been recommended to receive 1955 safety awards from the USBM, according to Joshua Smith, Coal Div. safety director. Sonman mine, Portage, Pa., has been proposed for the "Sentinels of Safety" bronze trophy for working 391,500 man-hours outside and underground throughout 1954 with only one minor injury. Griffith V. Jones, foreman of the Sonman mine, was cited for a 16-mo achievement. There were no lost-time underground accidents in the mine from May 5, 1953, to Oct. 21, 1954, during which period a total of 589,820 man-hours was worked.

Court Rejects Moffat Appeal on Wage Ruling

President Judge T. Linus Hoban, Lackawanna County, Pennsylvania, has dismissed the petition of Moffat Coal Co. for a court order vacating the Jan. 7, 1954, decision by the Anthracite Board of Conciliation that new rate sheets be renegotiated at four Moffat mines. Judge Hoban ruled that the issue involved is governed by conciliation machinery set up by the late President Theodore Roosevelt as a result of the long anthracite strike of 1902 and not by the State

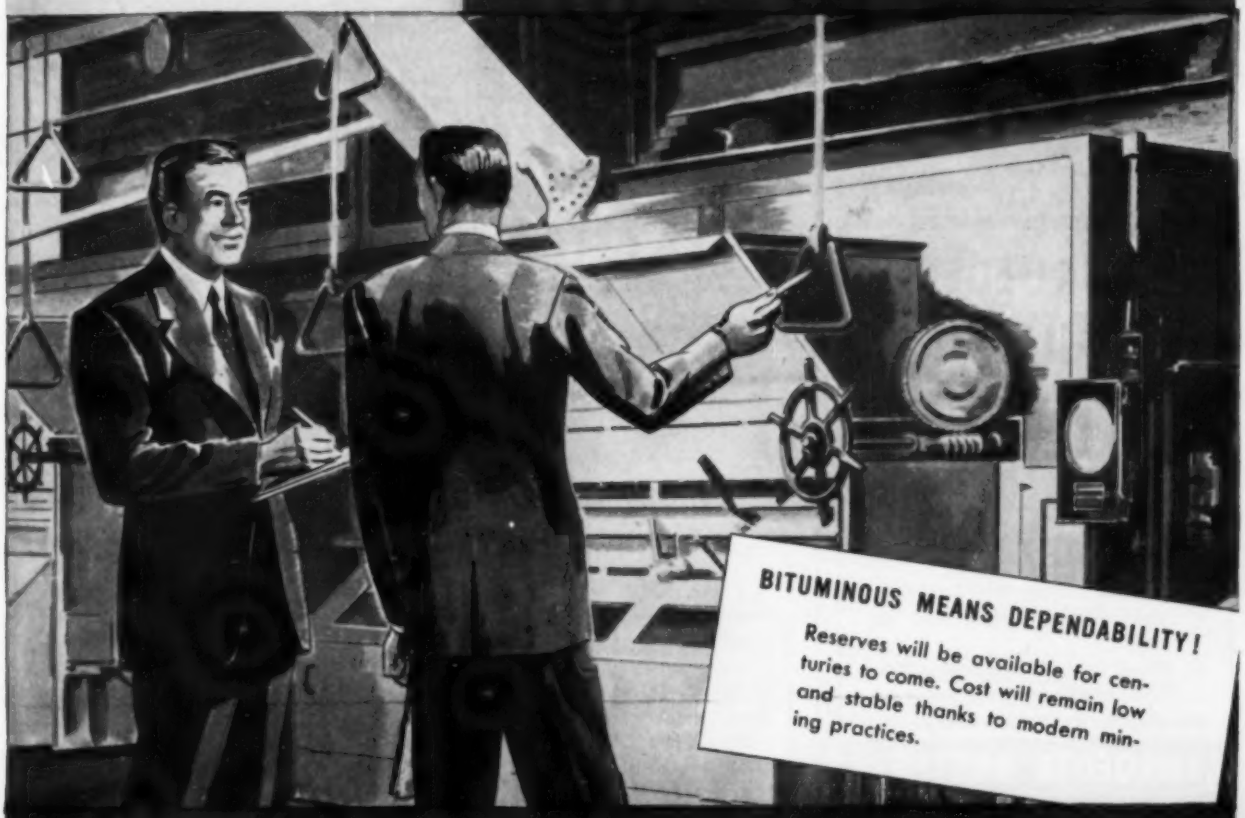
Are you now using the most efficient coal for your purpose?

LET OUR TECHNICAL SERVICE ADVISE YOU!

No two plants are alike—design and equipment characteristics make the difference. That's why it's so important to consider *kind* and size when selecting a coal for your particular burning equipment. The B&O Technical Service is prepared to study your specific problem and help you choose the correct coal. Here's what our service does for you:

- outlines Bituminous coals available for your plant.
- discusses the merits of these coals.
- establishes current and predicts future relative values of these coals.
- determines the best coal for your system.
- suggests the most efficient way to burn this coal.
- supplies case histories of actual savings in fuel costs.

Ask our man! Write:
COAL TRAFFIC DEPARTMENT
BALTIMORE & OHIO RAILROAD
BALTIMORE 1, MARYLAND



BITUMINOUS MEANS DEPENDABILITY!

Reserves will be available for centuries to come. Cost will remain low and stable thanks to modern mining practices.

LINKING 13 GREAT STATES WITH THE NATION B&O

Baltimore & Ohio Railroad

Constantly doing things—better!

BITUMINOUS COALS FOR EVERY PURPOSE

Teamed up for...
Faster, Safer
DRILLING!

SCHROEDER
Hydraulic
COAL DRILL

MODEL 12-B

Safe, dependable, fast drilling with complete safety . . . no spark, no kick . . . all electrical hazards removed yards from drill. Light weight Model 12-B is powered from hydraulic systems of standard mining equipment or can be furnished with Schroeder Tricycle Hydraulic Mobile Power Unit. Features minimum of operating parts and reduced maintenance costs.

SCHROEDER
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For hydraulic hand-held coal drills, assures faster drilling with less effort as a result of . . .

1. Reduced area of penetration for ease of feed.
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COAL MEN ON THE JOB . . .

JEWELL RIDGE COAL CORP., No. 5 mine, Logan County, Peach Creek, W. Va. —Herman Blevins (seated, left), section foreman; Robert Jeffrey Jr, night foreman; and Jess Neil, general mine foreman; Charles E. Stanley (standing, left), superintendent; W. S. Robertson, safety inspector for the W. Va. Div.; William Hall, Arthur Neil and Warren Hurley, section foremen; Dennis Adkins, chief electrician; and Cole Trent, section foreman.

Arbitration law of 1927, as Moffat contended. Litigation leading up to Judge Hoban's ruling stems from the alleged action of the Moffat Coal Co. in "cutting rates" after its lease of coal lands formerly operated by the Glen Alden Coal Co. Thomas Kennedy, vice president, UMWA, reportedly stated that Moffat's action "would destroy the very foundations of peaceful and orderly adjustment of grievances in the anthracite industry." Moffat is said to be planning an appeal to the State Supreme Court on Judge Hoban's ruling.

NEW KERSEY BIG "E"
444E TRACTOR

FIRST AND ONLY 4 WHEEL DRIVE — 4 WHEEL STEER TRACTOR
WITH HIGHEST DRAWBAR PULL EVER OFFERED

Trailers — Cars
Exclusive Kersey Design — Coal Supply and Man Trip Trailers
ANY SIZE OR CAPACITY

SPECIFICATIONS

Weight—8,000 lb.
Length—12 ft.
Width—74 inches.
Height—24 inches.
Ground clearance—6 inches.
Turning radius—18 ft.
Tire size—6:50x10, 10 ply.
Lights—2 Sealed beam.
Motors—2 Heavy duty traction type.
Wheelbase—80-inches. Drivegear motor, direct.
Controller—Magnetic contactors.
Brakes—Hydraulic disc, Airplane type with lock.
Battery—84 Volts, 25 Kilowatt hours, in steel trays, which will deliver six years life with reasonable care.

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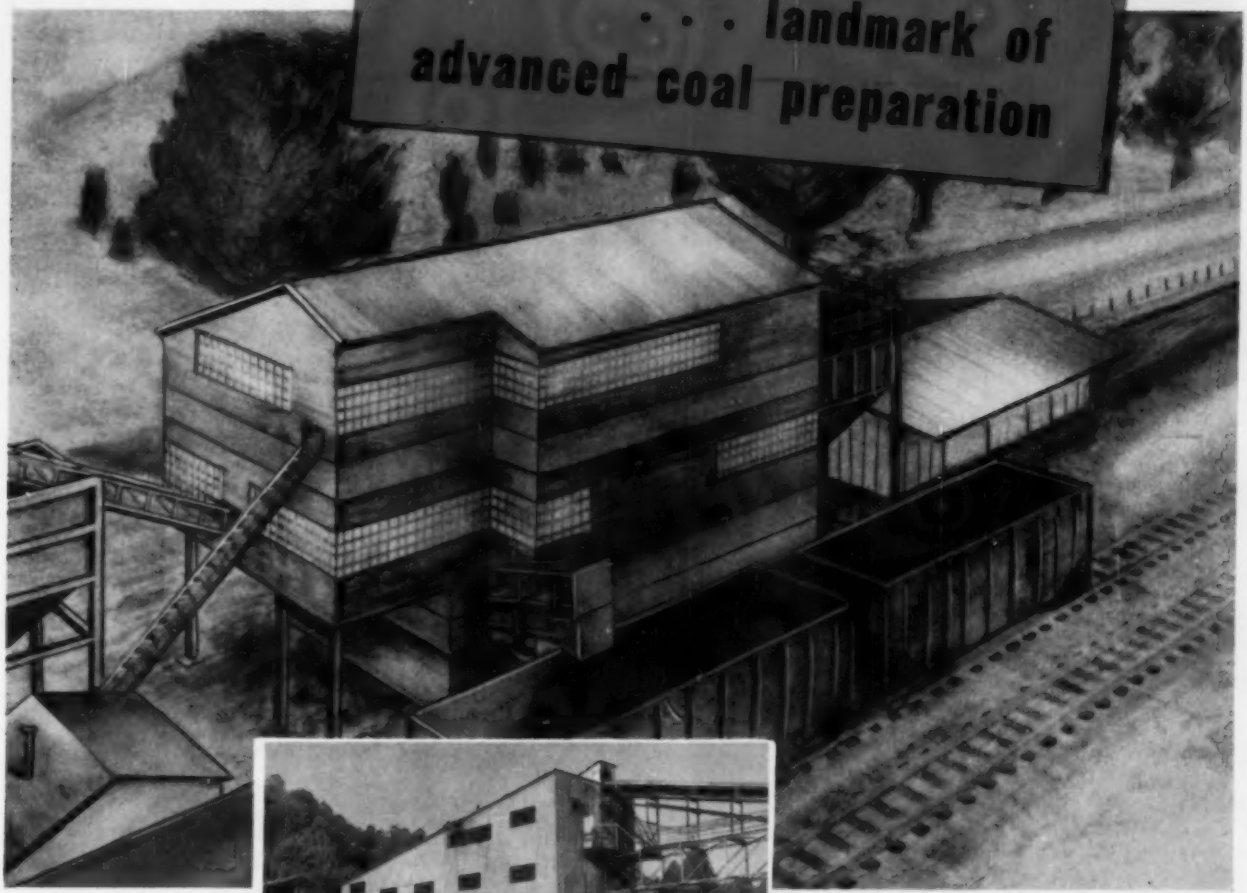
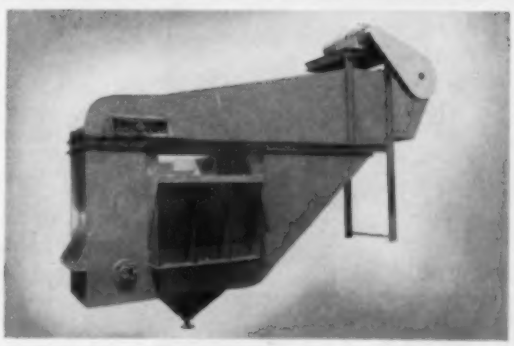
A DMS COAL REFINERY
. . . landmark of advanced coal preparation

Producing 150 tons of premium coal per hour, this DMS Refinery in Central Pennsylvania can be started or stopped in two minutes.



This 3000 ton per day Plant in West Virginia may be visited by appointment. Authorized personnel may arrange visits to other DMS Plants in Penna., W. Va., Va. or Ky. Write for appointment.



In capacities up to 700 TPH for standard sizes, DMS Washing Units hold the specific gravity level automatically and are protected against overloading.

Years Ahead In Cleaning Technique

Because they eliminate the guesswork in coal preparation, many DMS Coal Refineries are rising to become landmarks in profitable coal production. Achieving laboratory results on big-tonnage production, DMS is helping coal operators obtain the competitive security enjoyed by producers of manufactured goods.

Positive Control Of Quality

With less than 1% recovery loss on most coal seams, DMS Refineries produce coal to meet the most rigid requirements. Centralized operation permits one-man, push button control of the entire process. Less operating time and costs plus clean cut separation means increased profits for users of the DMS Dense Media System.

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dense media system

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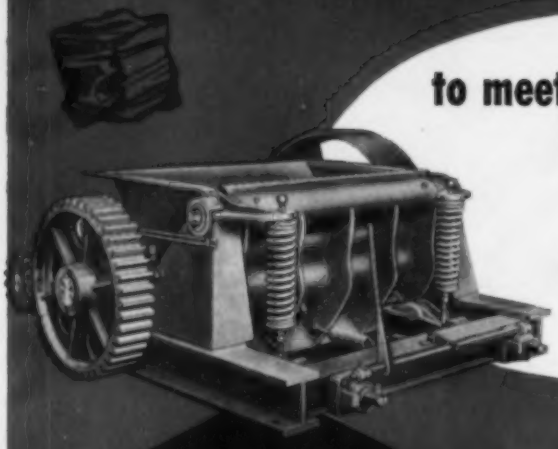
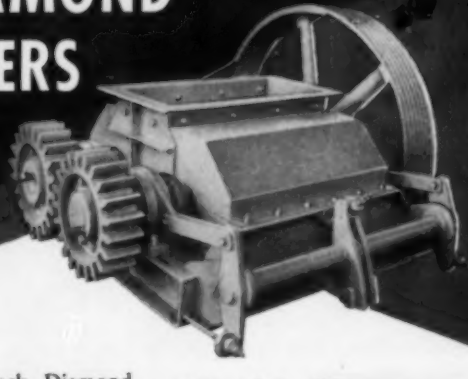
TO DESIRED SIZE

to meet all demands the efficient, economical, and practical way



McLANAHAN BLACK DIAMOND CRUSHERS



Dependable McLanahan Black Diamond Crushers crack large or small lumps of coal or similar materials to desired size with a minimum of fines. These machines are the answer to your coal crushing problems, and are built to handle high tonnages. Available in a complete range of sizes and types. These single and double roll crushers are constructed of cast steel, semi-steel, or fabricated steel, with bronze or anti-friction bearings for a long life of satisfactory service.

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Uranium Found in Western Lignite Coal Deposits

"Significant" quantities of uranium ore have been found in lignite coal deposits in western North and South Dakota and eastern Montana, the AEC explorations office, Grand Junction, Colo., has announced. Since existing laws do not provide for recovery of uranium from lignite coal deposits on public lands, the AEC has asked the U. S. Interior Department how to make these deposits available to individual miners and a ruling is expected soon. The explorations office said also that "exhaustive tests" are planned to find satisfactory methods for extracting uranium from lignite.

Jellico, Tenn. Seeks To End Mob Violence

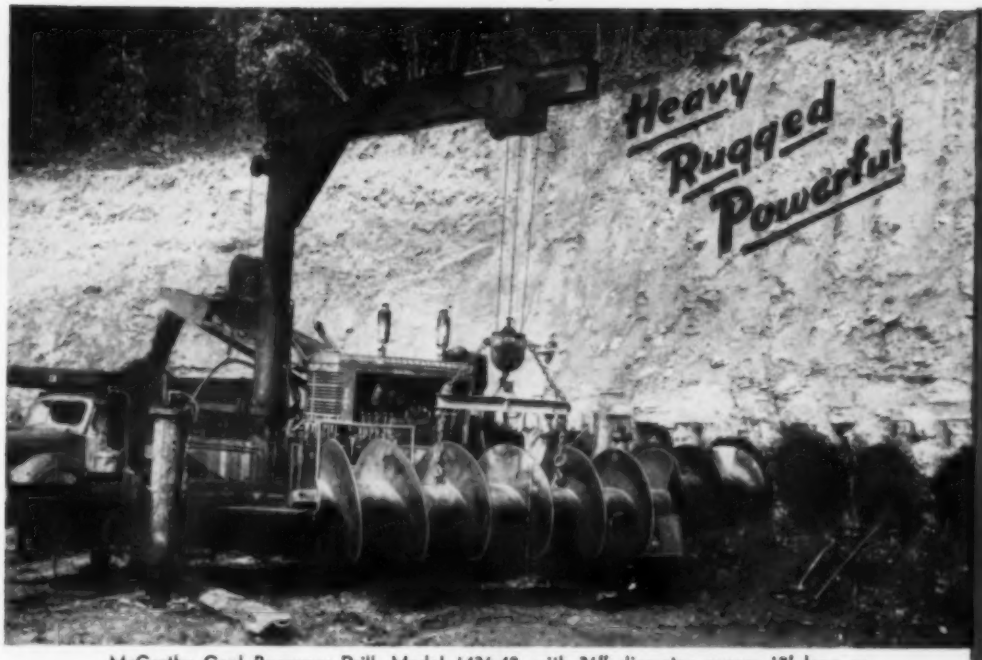
The Jellico (Tenn.) City Council voted April 7 to seek aid from Gov. Frank Clement in protecting local mine employees from mob violence. Council members and coal operators have also said that they would seek legal action against any mobsmen who threatened or terrorized strip miners. If no assurance of protection could be obtained, one coal mine operator hinted that coal operations would be closed. There was said to be no dispute with the UMWA, which denied any knowledge of the violence. On April 6 an organized band of about 500 men stopped coal trucks, dumped coal to the ground and beat up several men in an attempt to keep non-union mines from working and to prevent coal from being hauled for loading in railroad cars.

French Mineral Industry Society to Hold Congress

The Centenary Congress of the Societe de L'Industrie Minerale will be held at Saint-Etienne, June 16-18, and at Paris, June 18-July 3, 1955. The Congress will feature displays of the latest equipment produced by French and foreign manufacturers; models of mining works, or of recent mining and metallurgical installations; and works of art inspired by mining or metallurgy. The working sessions will be grouped according to seven special subjects: Thick Seams; Iron and Steel Manufacture; Mechanized Getting and Loading in Longwall Faces; Mechanized Getting and Loading in Room-and-Pillar Workings; Mineral Discovery; Underground Electrification; and The Mine of the Future. For further information, write to the Secretariat General Du Congres, 60, Boulevard Saint-Michel, Paris (VI), France.

Seek to Salvage Coal From Lehigh River

A 10-yr project was to be started May 1 to salvage $1 million worth of coal washed down from anthracite mines into the Lehigh River. Joseph Franciosa, Easton, Pa., and Jonathan Riber Jr., Mohrsville, Pa., veteran operators in salvaging waste coal, are launching the project. The salvaged coal will be pulverized and sold to such industries as paper mills and power plants.



McCarthy Coal Recovery Drill, Model 1436-42, with 36" diameter augers 12' long as used by Excavators, Inc., Sommerville, W. Va.

● Robert B. Cleghorn, Jr., Hodgeville, West Virginia, reports his hydraulical, self-moving 42" McCarthy Coal Recovery Drill (shown below) mines "up to 500 tons of clean, low-cost quality coal per day." Cleghorn has a three-man crew—operates in pits as narrow as 34 feet. Operator has total vision, including the highwall. Model 12 handles 24' augers from 16" to 48" in diameter.

Hydraulically operated equipment on McCarthy Drills includes: jacks for levelling auger drill, auger guide, auger hoist, moving jacks and skids, and auger feed.

McCarthy Auger Drills Lower Mining Costs

McCarthy Coal Recovery Drill, Model 1242-36, using 42" diameter augers 12' long.

THE SALEM TOOL COMPANY

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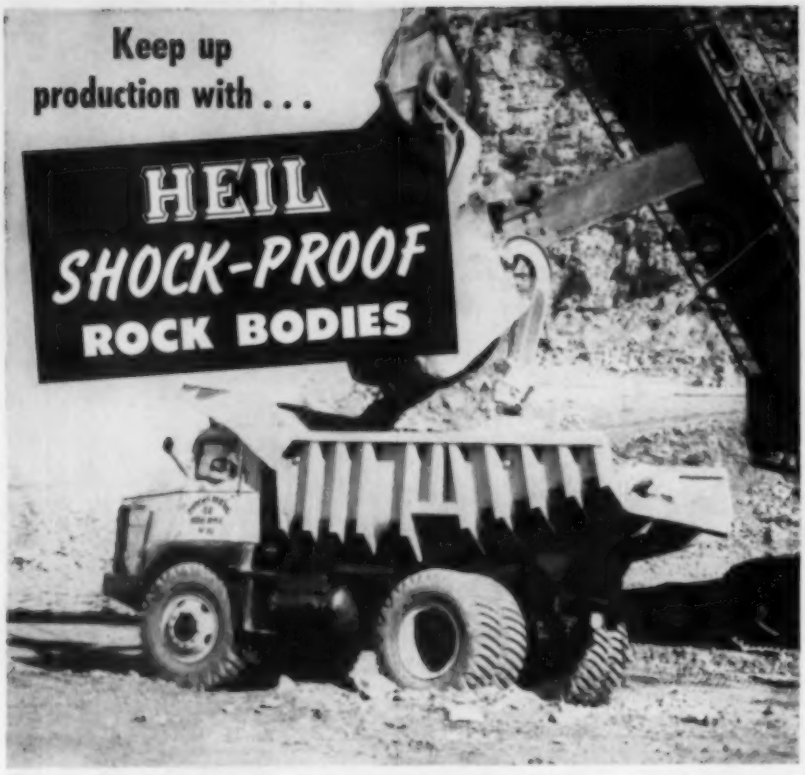

Here's How . . .

Dump a big dipper full of coal or overburden into a Heil Rock Body. Drop the heaviest load your bucket can hold into it. Give it the roughest shock treatment of a rough industry.

Production rolls merrily along!

As long as the trucks under them move, Heil Shock-Proof Rock Bodies are in your production line, because they're built to stay on the job and out of the shop.

The 2" hardwood cushion sandwiched between body bottom and wearing plate absorbs load shock. Bodies fabricated of ¼" (or heavier) steel plate, rigidly reinforced by box member ribs, assure "no sag" strength and stamina. For cold weather work or handling sticky gumbo, heated floor construction can be supplied.

HEIL HEAVY-DUTY HOISTS

Hoist performance is just as important to keeping up production as shock-proof bodies. Heil Hoists are matched to Heil bodies for always dependable, always economical durability.

Call your Heil distributor for proof of Heil Body and Hoist production in the field.

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BH-52-C

New Power Station Opens

The new Will County, Ill., electric generating station of the Public Service Co. division of Commonwealth Edison Co., the 12th in the Edison system, was placed in regular service March 21. This station is located on the Chicago Sanitary and Ship canal and is equipped to receive its coal supply by either rail or barge. The new station will require less than a pound of coal to produce a kilowatt-hour of electricity, compared with 1½ lb in some older Edison stations and an average of 1.23 lb for the entire Edison system last year. During the last, several months before the new station went into service, its reserve coal storage pile was built up to about 200,000 tons. The Will county unit, under construction for 3 yr, went into service with a 160,000-kw generating unit. A second unit is scheduled for this summer, and a third unit of 250,000 kw for completion in 1957.

Anthracite Bills Proposed

Legislation creating an anthracite mine-law study commission to investigate all laws relating to anthracite coal fields and to propose an anthracite code was introduced in the Pennsylvania House March 29. An appropriation of $25,000 would be made for the study, and a report to the 1957 legislature is directed by the bill. A companion measure would require state inspection of mines every 3 mo instead of 6 mo as at present. Two other anthracite bills were introduced. One would make it "unlawful" for mine owners to mine in such a way as to cause cave-ins. The other proposes an appropriation of $2 million for reconstruction and repairs to schools, churches and dwellings damaged by subsidence.

And For Your Information . . .

Orient No. 2 mine of the Orient Div. of the Freeman Coal Corp., West Frankfort, Ill., closed since Feb. 25, was scheduled to re-open on or shortly after April 18, according to reports. About 500 of the 700 men formerly employed were to be called back and the mine was expected to produce around the same tonnage.

100% completion of the USBM accident-prevention training by some 1,780 miners in the Lynch (Ky.) district of the U. S. Steel Co. was celebrated April 16 at a Safety Day Rally staged by the company at the Lynch athletic stadium.

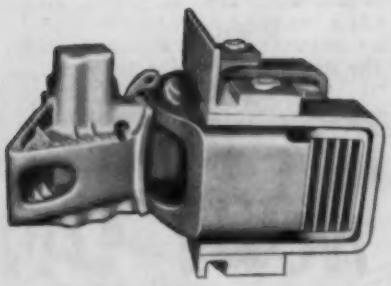
West German coal imports from the U. S. are expected to be between 3,500,000 and 4,000,000 tons this year, as compared with the 1954 total of 1,800,000 tons. Requirements of the steel industry are cited as the major cause.

Permanent closing of U. S. Steel's 54-yr-old Ronco coal mine in southwestern Pennsylvania will take place June 25 when the last minable coal will be removed. Layoffs of the mine's 400 men will begin soon. Company officials are meeting with representatives of the Fayette County Development Council on a program for future development in the district. The mine, located in Greene

NATIONAL equipment cuts per-ton costs

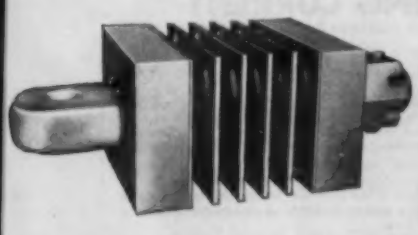
NC-1 MINE CAR TRUCK is the latest example of National's pioneering in better equipment. Among NC-1 truck advantages are longer and softer ride springs, friction damping mechanism that controls vertical and transverse oscillations, automatic frame alignment and cast one-piece bolster with large lubricated center bearing. A-9021

WILLISON AUTOMATIC COUPLERS save time with maximum safety, couple at either end of car or locomotive, require no manual assistance, eliminate damaging slack, permit high speeds with maximum stability.



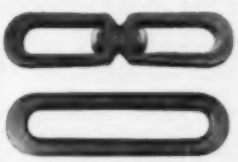
NATIONAL MI-235 Rubber-Cushioned Draft Gear primarily used in Willison spherical-horn coupler assemblies for drop-bottom cars and locomotives; are effective with link and pin bumpers and in strap yokes.

NATIONAL MI-225 Rubber-Cushioned Draft Gear for locomotives and large capacity cars not required to operate through rotary dump. Give maximum impact protection in minimum space.



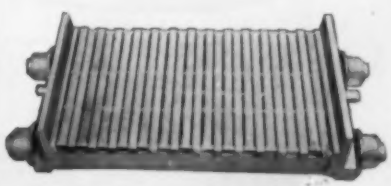
NATIONAL MI-230 Rubber-Cushioned Draft Gear for cars in rotary dump service. High-capacity rubber pads with soft initial action provide maximum impact protection, lengthen equipment life. Available in capacities and designs to fit individual requirements.

NACO STEEL WHEELS, made from quality-controlled Naco cast steel—of high yield point, great tensile strength and ductility—reduce tread spalling or flange breaking. Available in all sizes regularly used in mining or industrial operations.



NACO STEEL SWIVEL HITCHING AND LINK

CAST ALLOY STEEL ORE-GRINDING BALLS



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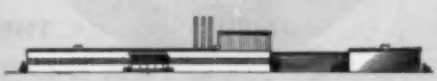
Technical Center



"Progress through Research"

LUBRIPLATE No 630-AA IS PRACTICALLY A UNIVERSAL LUBRICANT

—says

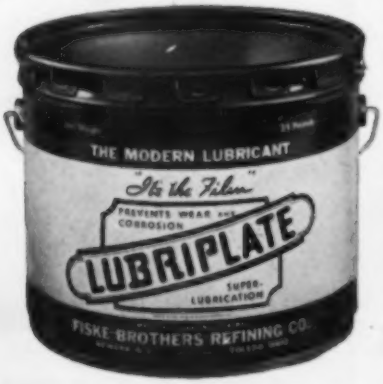
THE SPOKANE PORTLAND CEMENT CO.

"With the introduction of LUBRIPLATE No. 630-AA, we were able to satisfy all our needs for solid type lubricants with only two LUBRIPLATE Products. LUBRIPLATE No. 630-AA might almost be considered a universal lubricant. Furthermore, it has effected marked savings in both lubricants and labor!"

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose... LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.



and Fayette counties, was opened in 1901. Since then 25 million tons of high-grade coal have been dug.

The Central Electric Power Cooperative plans installation of a $100,000 coal dock on the Missouri River at Chamois, Mo. The new dock, with unloading crane, will be used to unload coal from river barges. The cooperative now receives 120 rail cars of coal a month, delivered by the Missouri Pacific R.R. for $2.74 a ton. This rate will be materially reduced with the completion of the new dock. The $2 million Chamois, Mo., power plant has a 150,000-kw output and supplies power to cooperatives through a network which also receives electricity from Bull Shoals.

The USBM plans to "explore the possibilities of using hard coal for metallurgical uses," Director John J. Forbes told a Senate Appropriations Subcommittee on Interior in Washington March 16. The statement was made to support an $18,863,000 appropriation requested for research during the coming year. The requested amount is $6,637,000 less than the sum for the current year. Mr. Forbes said the bureau also will continue most of the current coal projects.

Association Activities

Pocahontas Operators Association Elects

Officers of the Pocahontas Operators' Association, re-elected at the annual meeting in New York City March 25, were: Henry F. Warden, president; H. R. Hawthorne, vice president; Roland C. Luther, treasurer; and B. B. Housman, secretary. Re-elected to the executive committee were: Henry F. Warden, H. R. Hawthorne, Roland C. Luther, Wm. Beury, J. J. Foster, A. R. Mathews, W. W. Walker, W. F. Leatherman and Norton Stone. Also elected for another year were the representatives on the

NOW! ONE WELDER

IDEALARC... GIVES YOU

BOTH AC and DC

WELDING CURRENT

NOW DC Industrial Welder for operation on single phase power lines

NOW Rectifier Welder with both current and voltage controls

NOW Rectifier Welder with arc-booster starting

● One machine, Lincoln Idealarc, now gives you *both* AC and DC welding current. You have *both* current control and voltage control. For every job, you can now select the ideal arc... soft arc or forceful arc... AC or DC.

Shops which do not have 3 phase power can now use DC. Idealarc is the only DC welder to operate from single phase power available at reasonable prices in industrial sizes.

With dual arc control on DC, you have the same benefits of soft arc and forceful arc for welding with DC as with AC. Arc-booster starting on both AC and DC... on both soft arc and forceful arc... assures non-sticking, easy operation, speeds intermittent welding, gives full penetration at the start of each weld.

Idealarc cuts duplication of welding equipment... saves on welder cost. So why tie down your operations with one choice of welding current? Idealarc provides complete freedom to select the correct arc type and welding current for maximum speed, maximum ease and quality of welding... for the same investment.

SEND FOR FACTS

Send for Bulletin 1343
Shows how you can cut welding costs... now. Write!

THE LINCOLN ELECTRIC COMPANY

DEPT. 5402, CLEVELAND 17, OHIO

THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

Here's an opportunity to see the cost-cutting, timesaving "Aeroquip Idea" in action.

See how easy it is to make uniformly high quality *Aeroquip* hose lines. Imagine how quick you could replace damaged fluid lines right in the field with just a small portable supply of Aeroquip bulk hose and reusable fittings. Thousands of equipment operators do it, and *most of them standardize on Aeroquip!*

You are invited to bring your fluid line problems to the Aeroquip booth. And don't forget, your nearby Aeroquip distributor has a full line of high, medium and low pressure hose and fittings to meet your needs.

AT THE COAL SHOW...

See Hose Lines Made in Minutes!

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May 16-19, 1955

Aeroquip

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AEROQUIP CORPORATION, JACKSON, MICHIGAN

LOCAL REPRESENTATIVES IN PRINCIPAL CITIES IN U.S.A. AND ABROAD • AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

New Hi-Speed TIMBER JACK is TWO TIMES FASTER!

The dependability and safety of a screw-type jack with the fast operation of a crank! That's the combination offered in this new Simplex No. 642 Timber Jack. In mines, where fast timbering is often vital, this jack more than pays its way in doing the work of several men in raising and locating roof timber. With the head on a swivel, it can work right against a wall or rib. Capacity is 6 tons and there are five models with minimum heights as low as 3-ft., 6-in. and with maximum heights of 9-ft., 6-in.

Gear Cover Not Shown

Type "F"

ROTATING HEADS
To Fit All Timbers

Type "D" Type "E"

Ratchet Lowering Jacks for Thick, Medium and Thin Seams

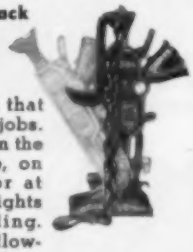
Raise or lower notch-by-notch for greatest safety. Three sizes for all types of seams. Also ideal for lifting or skidding mine machinery, re-railing mine locomotives. Capacity 5 tons. Double-lever sockets permit lifting in close quarters.

A COMPLETE LINE OF MINE JACKS

The Simplex line also includes ratchet and screw mine roof and timber jacks, post pullers, track jacks, anchor jacks for use with conveyors, hydraulic jacks and the famous Re-Mo-Trol and Jenny "Center-Hole" Pullers.

Write for Details in General Catalog No. 53 and Mines 47.

Emergency Jack with 4-Way Lift Power



Here's the jack that does a variety of jobs. It lifts 15 tons on the cap, on the toe, on the capshoe or at intermediate heights with a chain sling. The base tilts, allowing it to lift, push or pull at any angle.

WORLD'S LARGEST MFRS. OF INDUSTRIAL
MECHANICAL AND HYDRAULIC JACKS

SIMPLEX
RE-MO-TROL UTIL-A-TOOL JACKS JENNY ROL-TOE

TEMPLETON, KENLY & CO.
2501 Gardner Road
Broadview, Illinois

boards of directors of the various affiliated associations, and members of the various committees of the Pocahontas Operators' Association itself.

Officials Elected for W. Pa. Coal Operators' Group

At a recent meeting of the Western Pennsylvania Coal Operators' Association, held in Pittsburgh, Pa., the following officers were elected: G. A. Shoemaker, president; Charles B. Baton, vice president; Harry A. Sutter, executive vice president; M. C. Briggs, treasurer; and Earl Glass, secretary. Directors elected included J. Allan Brookes, S. M. Cassidy, J. M. Connor, J. E. Elkin, R. H. Jamison Jr., T. S. Jamison, W. A. McBride, C. C. McGregor, B. M. Neel, Henry C. Rose, Walter F. Schulten, E. A. Siemon, W. G. Stevenson, G. C. Trevorrow, G. West, J. R. Wilson, G. A. Shoemaker, and C. B. Baton.

Utah Coal Operators Elect

The following officers of the Utah Coal Operators Association were elected at the recent annual meeting: president, Oscar A. Glaesser, vice president, United States Fuel Co.; vice president, Philip K. Rains, vice president and general manager, Hi-Heat Coal Co.; and executive secretary, B. P. Manley. Directors elected were: A. B. Foulger, general manager, Lion Coal Corp.; D. A. James, vice president, Liberty Fuel Co.; W. J. O'Connor, president and general manager, Independent Coal & Coke Co.; P. L. Shields, president, Spring Canyon Coal Co., Royal Coal Co. and Standard Coal Inc.; Mr. Glaesser; and Mr. Rains. Mr. Glaesser succeeded Mr. James as president.

New Books for Coal Men

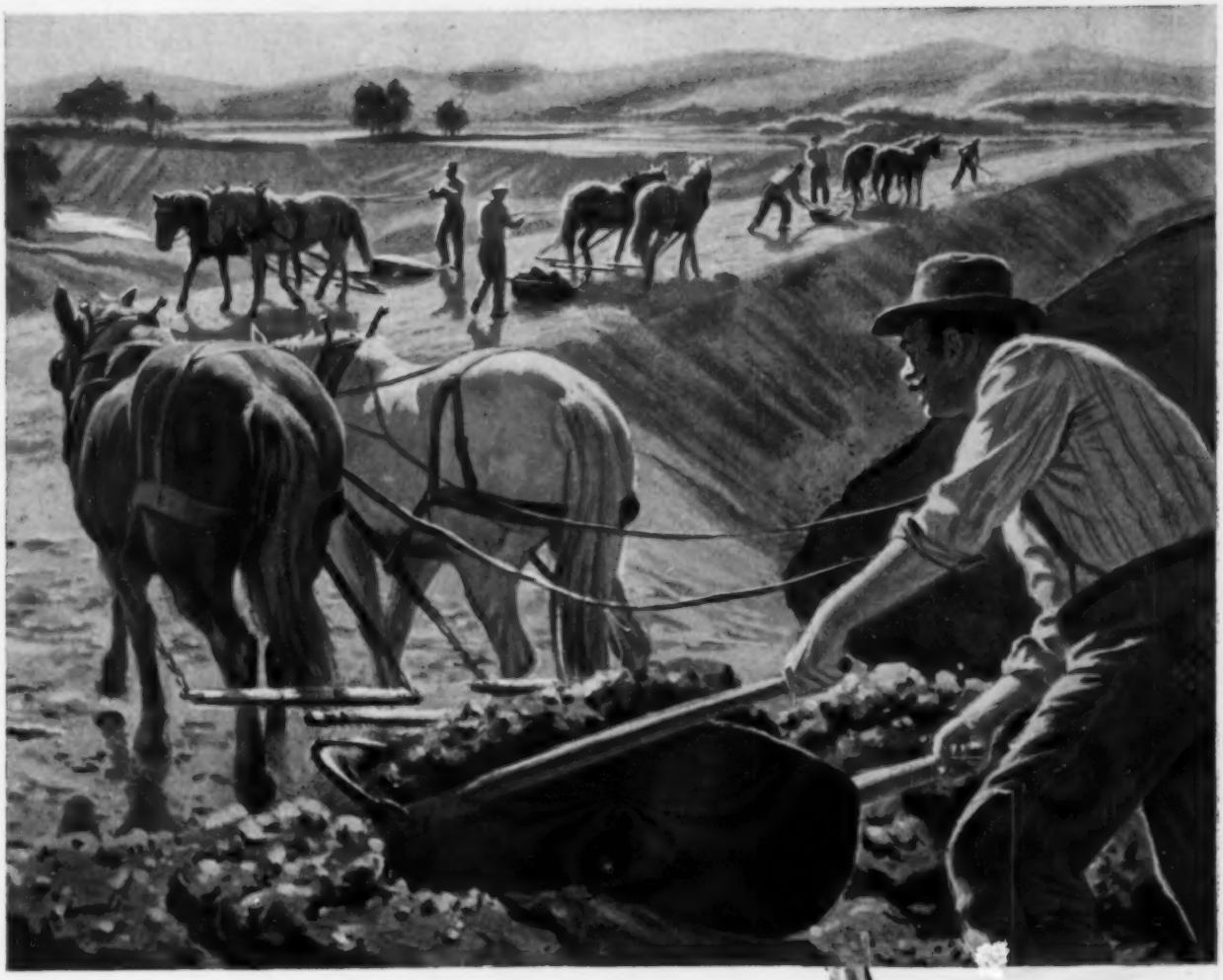
Accident Prevention

Accidents from Hoisting and Haulage in Bituminous-Coal Mines, Coal-Mine Accident Prevention Course-Sec. 3 (Revised March, 1954). Safe equipment, safe haulage roads, safe auxiliaries and safe practices are discussed in detail as four fundamental requirements for preventing accidents and responsibilities of operators and workers are outlined. *Miners' Circular 49, 40c, Superintendent of Documents, Government Printing Office, Washington 25, D.C.*

Explosives Accidents in Bituminous-Coal Mines, Coal-Mine Accident-Prevention Course, Sec. 5 (Revised March, 1954). Describes in detail tested procedures for minimizing hazards, gives details of many blasting accidents and how each might have been prevented. *Miners' Circular 58, 40c, Superintendent of Documents, Government Printing Office, Washington 25, D.C.*

First-Aid Training

100-Percent Co-operative First-Aid Training, Mines and Quarries, Colorado and Wyoming, by A. C. Moschetti and G. B. Fritts. Describes a program in which management, labor, two states and the USBM co-operated in giving every



no match for MUSCLES OF STEEL

America's towering dams stand as mighty monuments to the efficiency of modern excavating and earth-moving equipment. On these machines, *muscles of steel*—rugged wire rope—handle with ease and dispatch the tasks that once were back-breaking for man and beast.

Wherever big construction projects are under way, you'll find Wickwire Rope at work—helping to do a better, faster and more efficient job.

Same way—in the mines and quarries ...in the oil fields and logging camps... with the fishing fleets and in materials handling. Here, too, Wickwire Rope has won outstanding preference because of its proved durability and demonstrated reliability and economy.

every industry benefits from wire rope

WICKWIRE ROPE

CF&I PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
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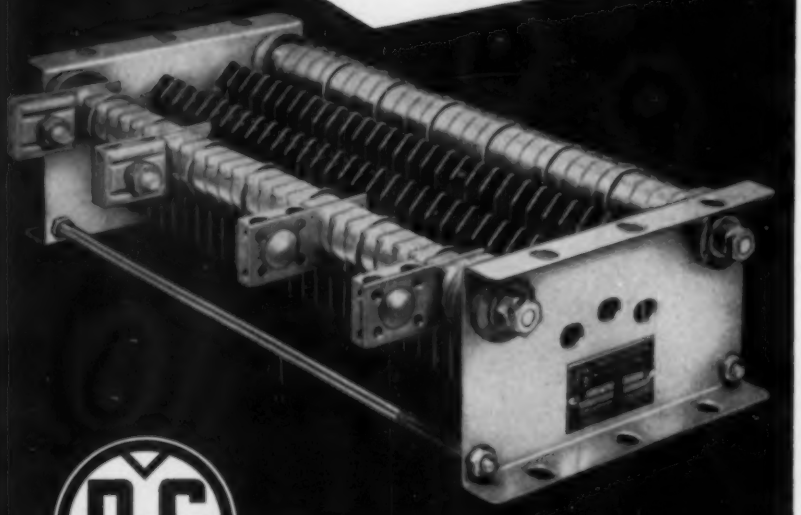
2696

There is a difference in Resistors



P-G Resistors have proved this for many years

Different, because steel and mica, both extremely durable materials, coupled with P-G exclusive design produce a resistor of great mechanical strength. There is nothing to break. With accurate resistance values and adequate carrying capacities, P-G Resistors outlast ordinary resistors. Tell us your specifications and let P-G solve your resistor problem.

For any job . . . Where constant "trouble free" resistor service is wanted . . . you can safely specify P-G Steel Grid Resistors and get better performance with low cost maintenance.

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employee of six mines and quarries the bureau's first-Aid course. *Information Circular 7712. Free. Bureau of Mines, 4800 Forbes St., Pittsburgh 13, Pa.*

Heating Guide

Heating, Ventilating, Air-Conditioning Guide, 1955. A new revised reference volume providing information on material and design specifications for heating, ventilating and air-conditioning systems plus instructions on application, operation and maintenance. *$12.00. American Society of Heating and Air-Conditioning Engineers, 62 Worth St., New York 13, N.Y.*

Bituminous Coal Research

Begins on p 150

lost ground in the large commercial, institutional and small industrial market—the office building, church, school, hotel, hospital and small factory, most of which are not located on railroad sidings."

The need is to educate architects and engineers, since one of the reasons competition succeeds is because such men "do not know how to get coal into the building and ashes out of it." Coal also needs to get back of the equipment and systems it develops. "Certainly BCR has gone beyond the research and development stages in several instances to obtain commercial realization of research results. . . . It seems quite obvious that greater use could be made of many BCR developments by the industry, and for the industry, than has been the case in the past."

Carroll F. Hardy, chief engineer, Appalachian Coals, Inc.

BCR Plans

"All three of these needed activities, namely, the search for basic knowledge, the development of improved equipment, and the dissemination of knowledge of coal and related equipment are included in the primary objectives of BCR." Problems that BCR, with facilities now available, can tackle in the next year include:

Residential and Small Industrial Market—Investigation of cross-feed burners for home use; improvement of the underfeed stoker; testing of packaged units for home use; testing of commercial crop dryer; continued testing to determine how cross-feed burners can be used with bituminous coal.

Industrial Market—Continued efforts to develop an automatic steam generator; improvement of the water-spray technique of reducing dust and soot emission from stacks; and continued work toward improving the coal "climate," including combustion and coal-handling conferences.

Utility and Coking Market—Investigation of new ideas for removing SO_2 from flue gas, and of a new idea for reducing the sulphur content of coal; further promotion of the use of fly ash and cinders.

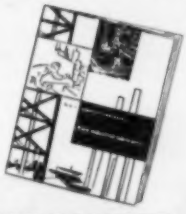
All markets—Study of new methods of reducing moisture in coal shipments and

Cut costs with Pure's "Simplify and Save" Plan

BE SURE PURE WITH PURE

If you're using more than 6 lubricants in your plant, chances are *Pure Oil's multi-purpose lubricants* can cut costs for you. Here's why: just 6 of these special lubricants are all you need—reduces your inventory . . . reduces chance for error in application (and resulting "down time") . . . and the fewer the man-hours needed for ordering, stocking and application.

Find out how Pure's multi-purpose lubricants can cut costs in your plant. Reverse the charges to your nearest Pure Oil office today.



FREE BOOKLET tells you "How to Simplify and Save." Write The Pure Oil Company, 35 E. Wacker Drive, Chicago 1, Illinois. (Offer limited to Pure Oil's 24-state marketing area.)

Be sure with Pure **PURE MULTI-PURPOSE LUBRICANTS**

Sales offices located in more than 500 cities in Pure's marketing area

more and better "Aids to Industry" publications.

Other suggestions must be postponed to the future in view of the limited budget and facilities.

James R. Garvey, assistant director of research, BCR.

The Coal-Fired Gas Turbine

"Since January, 1953, the coal-burning gas-turbine program has been carried on as a cooperative project by the Locomotive Development Committee and the American Locomotive Co. The work authorized for 1953-54 was divided into three parts:

"1. Coal Supply—Study and develop most economical means for supplying suitable coal for gas-turbine locomotives.

"2. Ash-Separator Development—Design, build and install an improved fly-ash separator.

"3. Turbine Testing—Install four new rows of blades in the LDC turbine and conduct tests to determine whether the new separator can prevent blade erosion."

Major progress or completion of these projects resulted in a decision to try for continuous operation at high load in 1955. Up to April 2 a total of 443 hr had been accumulated on both Pittsburgh No. 8 and Pocahontas No. 5 coals.

"The 1955 tests have shown that the coal-burning gas turbine can carry full rated load for long periods of time on both high- and low-volatile coal. The average specific coal rate was slightly below 1 lb per hp-hr, giving a thermal efficiency of 20.8%.

"Study of the problems of gas-turbine locomotive fuel supply led the Subcommittee on Coal Supply and the LDC staff to conclude that the use of $\frac{3}{16}$ x 0 dried coal would be highly advantageous from the standpoints of availability and low price . . . approximately 15c per million Btu, compared with 22c per million, which was the average price paid in 1954 by LDC member railroads. With diesel fuel averaging more than 80c per million Btu, the economic advantage of the coal-burning gas turbine is becoming increasingly important. The annual fuel bill for a 4,500-hp freight locomotive making 96,000 mi per yr at a 55% load factor is approximately $75,000. A coal-burning gas-turbine locomotive doing the same job would use approximately $32,000 worth of coal."

John I. Yellot, director of research; Peter R. Broadley, assistant director; and William M. Meyer, manager of gas turbine test, LDC.

. . . the World's Largest Shovels and Draglines are Lubricated by

WHITMORE'S

1— Gear Protective Composition for use on open gears.

2— Anti-Friction Composition for use on any type high-speed bearings.

3— Lubricants for reduction gear units.

4— Pressure-Proof Lubricants (Super E.P.) for heavy duty trucks and tractors.

5— Cable Lubricants for use on wire ropes and cables.

Be sure and stop at our Hollenden Hotel headquarters to see the Durkin Electric Applicator which revolutionizes open gear lubrication.

Serving the Mining Industry For Over 60 Years

THE WHITMORE MANUFACTURING COMPANY

Factory and General Offices, CLEVELAND 4, OHIO, U. S. A.

Mining Development

The primary goal of the Mining Development Committee is increasing tons per man at the face. Therefore the committee concentrates on developments that will contribute to that result. In 1955, face labor costs under 20c per ton were achieved in some areas under certain specific conditions, and it may be anticipated that such costs will become more frequent.

Major MDC projects now under way or being investigated include:

1. Development of leg-and-beam-type temporary roof support for continuous-miner openings.

2. Further development and field testing of the Irwin BCR portable 19-ton surge car and bridge conveyor.

3. Further development and test of the Irwin BCR tandem conveyor. In practice, 20 units would permit working a 300-ft place. Requires one man to operate.

4. Consideration of steps that might be taken to eliminate possible bottlenecks in main-line haulage in the future, including possible use of the "trolley-conveyor" principle.

5. Further development of the steel belt. One United Electric wheel excavator is equipped with a 300-ft stacker belt, $\frac{1}{16}$-in steel, 1,000 fpm, costing $1,000, against $20,000 for conventional belt.

6. Further extension of face-lighting work, sponsored by M-S-A. Initial installation at Montcoal mine highly successful and management has approved its extension.

These and other developments should contribute to lower face labor and total mining costs by raising tons per man.

Gerald von Streh, director of development, MDC.

Cleveland BCR Miner

Extreme care has been taken to make the Cleveland BCR miner a machine that

LEADOLENE
Klingfast

THE "IP"* LUBRICANT

PROVES PROFITABLE FOR THE TOUGH LUBRICATING JOBS

IN MECHANIZED MINING

Specifically compounded for your particular needs, LEADOLENE KLINGFAST is a tough, lead-based lubricant with a great variety of applications in the coal industry. This lubricant . . . with its "indestructible pH-ilm" making possible efficient lubrication even in the presence of coal dust and other abrasive factors . . . regularly reduces costs and extends equipment life on the toughest of applications.

We suggest you read the accompanying case histories to see what LEADOLENE KLINGFAST has done for others . . . then describe your toughest lubrication problem and Brooks will prepare a sample designed to give best service on that particular application.

*I.P. . . . "Indestructible pH-ilm," capable of withstanding pressures up to 50,000 psi.

The Brooks Oil Co.

Since 1876

Executive Offices and Plant . . . . CLEVELAND, OHIO
Executive Sales Offices . . . . PITTSBURGH, PA.
Canadian Office and Plant . . . . HAMILTON, ONTARIO
Cuban Office . . . . SANTIAGO de CUBA

Case Studies

WIRE ROPE

A certain strip mining shovel, on which a conventional lubricant was used, had a wire rope failure on an average of every 18 days of service. A single application of KLINGFAST extended the service to a record of 31 days.

CORROSION PROTECTION

Due to sulphurous and other extremely corrosive agents used in quenching, the steel work in and around the quencher station of by-products coke plants is subjected to most severe corrosion. In one specific application maintenance costs were particularly high since no paint would protect for as much as a year. A grade of KLINGFAST, which was brushed on as a protector coating, gave in excess of two years of protection.

OPEN GEARS

A motor-operated hoist equipped with double herringbone cut teeth pinions and gears is used to operate 5-ton clam shell buckets at a large coke plant. Although a high grade plastic compound was applied every 24 hours, it failed to prevent wear of the gearing. On this application, which includes intermittent operation, reversing, high speed, severe shock and contamination from coal dust, KLINGFAST is applied only once every 10 days, and costs 25% less per pound than the lubricant it replaced.

DIPPER STICKS

Due to excessive moisture and other conditions, a company had to lubricate their shovel dipper stick once each day. Since KLINGFAST has been adopted as their standard, lubrication application now is necessary only once every three weeks.

MINE EQUIPMENT

Mining machines are quite a problem in lubrication because of water, dust, shock, vibration, speed and excessive loading. LEADOLENE fluids have proven a great advantage in the gear cases of loaders in one large mine because of repellence of water, adhesiveness to prevent excessive leakage, high film strength to prevent wear of gears and worms and other characteristics for this tough job. Lubricants take a terrific beating and LEADOLENE is one that stands up and takes it.

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More strength at lower cost— with JalKlamp

Here's the newest way to cut your materials handling costs.

J&L can furnish safer, stronger wire rope slings and terminals *at lower cost* thanks to JalKlamp, the new sleeve for wire rope splicing, exclusive with J&L.

The reason: non-corrosive JalKlamps are made from a special alloy. When hydraulically pressed around the rope, this alloy flows into the spaces between the wires and strands . . . produces a neat, permanent, watertight splice that's stronger than any tucked splice. And, because they're machine made, JalKlamp splices cost less.

JalKlamp slings and terminals are available for all standard wire rope constructions and in diameters ranging from ⅛" through 2", with SpringKore, Plasti-Kore, Fiber Core, and Independent Wire Rope Centers.

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will operate as near continuously as possible with a minimum of maintenance, and also to provide the maximum power for mining in the smallest possible space. Thus, for example, there are no internal nuts and bolts, the entire unit was stress-analyzed, as in designing an airplane; bearingless gears are employed in certain critical applications, and the machine is 87% solid by volume. Controllers are designed to take only 60% of the space previously required. The machine now had six mining heads instead of the original four, and as much as 100 hp can be applied to an individual head if hard cutting demands it. This is made possible by an all-mechanical head drive, which permits each head to demand and exert as much horsepower as necessary up to clutch capacity.

Spencer Bowman, Cleveland Rock Div., LeRoi Co.

Program and Needs

"BCR is applying science and technology to:

"1. Improve the competitive position of coal through new and improved equipment to protect present markets.

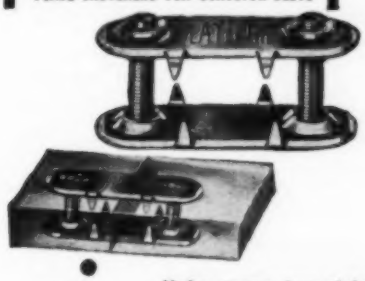
"2. Help develop new markets for coal.

"3. Obtain and distribute reliable technical information on coal and coal uses to increase satisfaction and public acceptance.

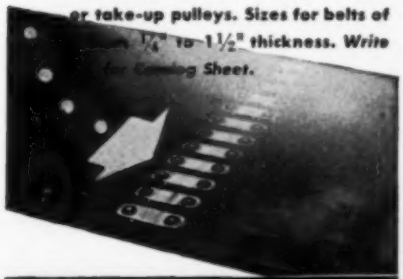
"4. Stimulate coal research and de-

PLATEGRIP

PLATE FASTENERS FOR CONVEYOR BELTS



Make strong dust-tight, water-tight joints in belts of any width. Special design spreads tension uniformly across belt, allow natural troughing of belt and assures smooth operation over flat, crowned or take-up pulleys. Sizes for belts of 1/4" to 1 1/2" thickness. Write for Catalog Sheet.



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YOU SAVE TIME. Using one Dooley "Rock Eater" Roof Drill, operators in a medium-high Illinois coal mine found they could drill and set expansion bolts in 19 six-foot holes in only 1½ hours—that's less than 5 minutes each! This speed results from:

1. *Exclusive double-action telescoping drill mount.* Provides power for both up and down movement. Also used to push roof bolt into position for setting.

2. *Unique drill drive.* Uses a combination electric motor with hydraulic feed. Drill speed is constant, but feed can be adapted to the material being drilled, saving breakage and wear on drills and drill parts. Drills up to 50" without changing steels.

3. *Convenient controls.* Enable operator to handle entire drilling operation from one position.

4. *Swinging drill arm.* Easily swung around, permitting holes to be drilled anywhere on a 240° arc with a radius of 8 feet from just one position!

CONVENIENT CONTROLS

YOU MAKE MONEY. Extra speed in roof bolting eventually means extra tons per man shift . . . and a Dooley "Rock Eater" will give you that extra production. It's custom designed for your coal height, comes mounted on mobile truck complete with clutch and transmission. Send coupon at right for further facts NOW!

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Gentlemen:
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Successful Mine Operator Endorses Spencer Product

Bank-shooter charging drillhole with Akremite, Maumee Mine No. 20.

"We have employed in our experimental work in connection with the development of the AKREMITE Blasting process several grades and types of Commercial Grade Ammonium Nitrate, all of which may be successfully used in the process. Maumee has been using for the past year, or more, the Spencer Chemical Company product which we have found to be well adapted to our own use and in our experimental testing at a large number of shooting jobs on the properties of other mining companies."

HUGH B. LEE, President
Maumee Collieries

The principal material in the manufacture of Akremite is ammonium nitrate. Spencer Chemical Company, one of the world's largest producers, has developed a Commercial Grade Ammonium Nitrate especially for the Akremite Blasting Process. Spencer is prepared to supply your needs.

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DON'T FAIL TO SEE THE

FAILING "CBH" HOLEMASTER

FAILING ENGINEERING SKILL, experience and know-how, have been combined to produce for the mining industry a rugged, compactly built, highly mobile rig, designed especially for the fast drilling of vertical blast holes. The CBH Holemaster combines the popular hydraulic chain feed with the use of compressed air for the removal of cuttings. With the CBH Holemaster you get holes that are clean, straight and easily positioned. And you get them fast!

The CBH Holemaster will be on demonstration at the Coal Show in Cleveland, May 16-19. Be sure to visit the FAILING exhibit (outside space No. 440) and learn firsthand the many advantages of the CBH Holemaster.

NEW
HYDRAULIC CHAIN FEED
BLAST HOLE RIG

FIRST OFFICIAL SHOWING OF THE NEW FAILING LOGMASTER RECORDER

THE MODEL WUS is a new FAILING-engineered recorder with a two-pen, continuous ink drawing mechanism designed specifically for recording simultaneously, versus depth, any two of a wide variety of surveys run in a bore hole drilled into the earth. Note these features:

- **ACCURACY** to a high degree, consistent and easily maintained.
- **VERSATILITY** permitting use in a wide variety of surveys using present standards, and new surveys that will be used later.
- **RUGGEDNESS** — Extreme vibration will not affect traces.
- **SIMPLICITY** — Easy to trouble shoot and economical to service.
- **OPERATING TEMPERATURES:** Sub zero to 160°F. (ambient)
- **SIZE:** 17 x 19 x 19 inches. Net weight, 102 lbs.

Manufactured by Union Switch and Signal, a division of the Westinghouse Air Brake Company. Distributed and serviced by the George E. Failing Company, Enid, Oklahoma. For prices and delivery dates, contact the Sales Department.

George E. Failing Company
A SUBSIDIARY OF WESTINGHOUSE AIR BRAKE COMPANY
ENID, OKLAHOMA, U.S.A.

FAILING rigs are worth more NEW . . . worth more USED!

velopment work by others. . . .

"It is a matter of grave national concern that United States coal production has not kept pace in recent years with the general rise in energy consumption. One can compare, for example, average production during the past 5 yr with the 5 yr immediately preceding our entry into World War II. This comparison shows that coal production increased 9% while total energy requirements increased 39%. This situation is an important factor in planning and evaluating the activities of your research association. . . .

"BCR is primarily concerned with the application of science and technology to help bring about an expanding and prosperous coal industry. The survival of individual mining companies now, and the prosperity of coal regions and the entire industry in the future, depend to an important degree on finding and using the best methods to mine, transport, market and use coal. All of these basic factors need the vitalizing stimulus of increased research and development. The work yet to be done requires expenditures far greater than the total which is being invested in coal research at present by all groups concerned. Therefore, BCR not only administers its own research programs but has the additional objective of stimulating coal research and development by others."

Harold J. Rose, vice president and director of research, BCR.

Continued on p 204

M-1 BLACK

. . . A special form of Carbon ideally suited for industrial explosives is used in AKREMITE, new blasting medium developed and patented by the MAUMEE COLLIERIES CO.

AKREMITE prepared with M-1 BLACK

assures efficient, safe and economical results in strip mining. More than 10 million pounds have been shot to date without misfire or accident.

For perfect AKREMITE results, M-1 BLACK is the carbon to use.

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THE EASY WAY

WITH

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Neoprene Coated Nylon

FLEXIBLE VENTILATION TUBING

One man carrying 100 ft. 12" dia. NEOLON TUBING, approximate weight 40 lbs.

Versus

Ten men, each carrying a 10 ft. length of 12" dia. metallic pipe (total 100 ft.) weighing approximately 1070 lbs.

Plus **THESE FEATURES:**

- √ Easier to install underground.
- √ Easier to move from location to location.
- √ Unaffected by acid mine water.
- √ Cost less than metal pipe—about 20% less and shipped freight prepaid.
- √ No "dents" from blasting.
- √ Outlasts any other flexible tubing.

√ CAN'T TEAR!

SEND FOR SAMPLE AND PRICES.

AMERICAN BRATTICE CLOTH CORP.

200 S. Buffalo St., Warsaw, Indiana

US RUBBER

United States Rubber Company 4-year project pays off—
mine operators report they're well ahead with U. S. Royal!

"Practically eliminated our downtime"
says P. Correale, Correale Construction, Hazleton, Pa.
"There's no tougher test for tires than anthracite coal stripping. Tire failure here can knock out a truck for a 7-hour shift—*for a $400 loss.* But U. S. Royal Con-Trak-Tors have practically *eliminated* our downtime."

Down Goes Downtime!

The new U. S. Royal Con-Trak-Tor—Full Lug, an important result of U. S. Royal's 4-Year Truck Tire Project, is cutting equipment downtime 'way down for leading mine operators like Correale Construction Co.

Good reasons, too! The Con-Trak-Tor's *Nylon cord carcass* stands up to vicious shocks, shrugs off rocks and snags. It has *triple impact protection*—extra rubber between plies, double shock-pads under the tread, extra-tough construction at the crown. Its *full lug traction* pulls right through toughest going, just *won't* bog down!

Why not let the Con-Trak-Tor prove it can reduce *your* downtime, lower *your* operating costs? Your U. S. Royal Dealer has this great tire in your size. Have him put it on your wheels—and prove to yourself why mine operators like Correale Construction Co. report they're *well ahead* with U. S. Royal!

U.S. ROYAL NYLON CON-TRAK-TOR FULL LUG

ASK YOUR U. S. ROYAL DISTRIBUTOR TO SHOW YOU THE NEW FILM ON BETTER HIGHWAYS: "MEMO TO MARS"

Kleenslot

WEDGE WIRE PREPARATION SCREENS

mining

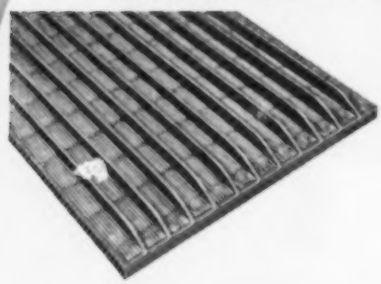
foods

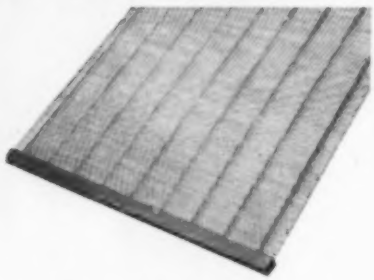
chemicals

abrasives

oil

FOR DEWATERING, SCREENING, WASHING, EXTRACTING, FILTERING or SIZING APPLICATIONS





SCREEN GUARDS

A new innovation in the mining and industrial field. Particularly adaptable for use in flumes. The screen guard is built right into the screen and the vertical guard bars keep the larger lumps of material above the guard bars, permitting only the finer particles to pass over the screen. Special sizes can be furnished.

VIBRATOR SCREENS

They can be designed and adapted to fit any make of vibrator. You do not have to change your present machine to accommodate this screen. It is of quality construction and built to give maximum service. The rigid construction and method of installation prevents "whipping".

MARCEL-TYPE SCREENS

This screen is entirely different inasmuch as it is of a Marcel-type construction. It was designed for operations where slivers passing through are objectionable in the end product. This screen can be made in all sizes and shapes wherever applicable to higher and productive efficiencies. It gives long life and non-blinding operation.

ALUMINUM SCREENS

This aluminum screen has all of the attractive and sturdy features of many other metals. In addition, it offers flexing action that adds capacity and dewatering abilities which are almost unbelievable. No changes are necessary in the body of the screen to effect its installation.

NON-BLINDING — NON-CLOGGING – LONGER LIFE – MOST ECONOMICAL

The diagram at left shows all of the efficiency that can be furnished to you by KLEENSLOT Wedge Wire Preparation Screens, inasmuch as the wedge construction permits easy clearing. KLEENSLOT Wedge Wire Screens can be furnished in practically any type of metal. It costs nothing to obtain a Wedge Wire recommendation free of charge. Complete literature is available for the mining, oil, food, chemical and abrasives industry. There is a KLEENSLOT Wedge Wire Screen for every application.

★

WEDGE-WIRE CORPORATION

GAS STREET AND NICKEL PLATE R. R.
WELLINGTON, OHIO

COST-CUTTING MEMOS:

USE PROPER LENGTH LEG WIRES: Use leg wires long enough to initiate each blast at the point of maximum confinement, usually the bottom of the hole. Improve profits with more yardage per shot, better fragmentation, and fewer misfires. For dependable circuits, use the new ATLAS Twinplex assembly . . . extra long and strong. Tough plastic sheathing protects wire insulation in rough holes. Specially made for thrifty bottom initiation with Rockmaster® electric blasting caps.

COMPARE SAFETY ADVANTAGES: Wider use of Rockmaster® millisecond delays, both in open pit and underground, is due to the relatively greater safety they afford. Millisecond delay blasting often lessens danger from damaged roof supports . . . reduces risky successive-firing and secondary shooting. ATLAS Rockmaster "16" System improves stope fragmentation, makes easier slushing, and can substantially increase footage per shot—for greater savings.

CHECK RESULTS: Examine each shot for both breakage and displacement. Note methods used, existing conditions, and the amount of secondary shooting required. Surveying results with your ATLAS Representative can uncover ways to effect money-saving improvements. ATLAS Technical Service can help solve your blasting problems . . . give you better results, better profits.

ORDER WISELY: Advance-order your millisecond delays so that periods needed are always on hand. Stock a magazine for your particular needs with the aid of your ATLAS Representative. He'll help you select the right explosives and the Rockmaster blasting patterns best suited to each job. Continuous production and good breakage lower costs, boost profits.

BETTER BLASTING can cut costs and increase production per man hour substantially. A few cost-cutting ideas are shown here. Your ATLAS Representative knows many more, and can recommend those that specifically apply to your particular job. Check your present blasting methods with him. His suggestions may improve your profits considerably. And be sure to get "Better Blasting"—Atlas' periodical bulletin of latest methods and equipment. Put your name on our mailing list today.

ATLAS

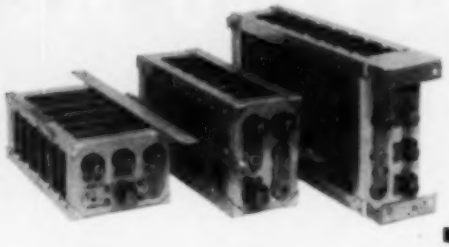
ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY,
WILMINGTON 99, DELAWARE

Offices in Principal Cities

GUYAN RESISTORS for LOADERS



With mining machines and mechanical loaders becoming so vital to low cost production, Guyan Resistors have been designed to give trouble-free operation on all types of mechanical equipment.

•

For a complete line of quality, long life resistance products — consult GUYAN.

THEY FEATURE—

1. Low cost for a premium class resistor.
2. Non-breakable helical coil construction.
3. Corrosion-resistant chromium alloy steel coils.
4. Light weight for ease of handling.
5. Clamp type bronze terminals for rigid connections.
6. Terminals easily accessible and plainly marked.
7. Fit your machine without alterations.

GUYAN MACHINERY CO.
LOGAN, W. VA.

Stick Free CORE SHELL

multiplies mechanical operating life 5 to 6 times

A unique one-piece drawn core-shell with embossed guide points increases the mechanical operating life of the Durakool Timer-Relay five to six times, practically putting it in a "fail-safe" class. These relays are available in single or multiple units with single unit capacities of 10, 30 and 60 amperes. Time delays from 0.15 to 20 seconds—any operate-release time combination. These new 1955 relays are now in production —no extra cost.

See telephone directory for local distributor, or write.

PRE-SET TAMPER PROOF TIMER-RELAY

GUARANTEED FOR AC-DC APPLICATION and:

- No plunger sticking
- No chatter
- Quiet operation
- No double contacting

DURAKOOL, INC.
ELKHART, INDIANA, U.S.A. ••• 700 WESTON RD., TORONTO, CANADA

Durakool ALL-STEEL MERCURY *Timers*

Service to Coal

"The question arises as to how BCR, with its present facilities, can concentrate its laboratory research effort to be of greatest service to the coal industry." Of the several types of research—fundamental, exploratory, applied, development and production—BCR has built its existing facilities around the supposition "that the most urgent needs of the coal industry at the present time are for improved and more-automatic residential and industrial coal-burning equipment and the coal- and ash-handling accessories associated with this equipment. For this reason, we are currently in a much-more favorable position for the conduct of applied and development research than for fundamental research." An example of applied research is the automatic steam generator; of development, the crop dryer. BCR also is equipped to do exploratory research, such as a study of the possibilities of cross-feed burner units for the home.

"In summarizing, it can be stated that while problems exist which require activity in all phases of research, BCR can, in the near future, make its greatest contribution by concentration of its laboratory research facilities on exploratory, applied and, to a more limited extent, development research."

J. R. Garvey, assistant director of research, BCR.

"Ability to Compete"

"It is our understanding that the coal industry has been spending approximately $5 million annually on coal research in recent years, which amounts to only 0.2% of the coal industry's sales dollar, which is recognized in many circles as being inadequate. Added to coal's investment is the $6 million invested each year by related industries, such as, steel and railroads. By comparison, the oil industry alone invests some $120 million in research and the chemical industry $300 million.

"Competition begins, first, in the attitude of management toward the amounts to be invested in research, and the business and the industry which proves its ability to compete in the research laboratory will have just that much less difficulty in competing in the marketplace. This is the challenge the bituminous industry must meet. It may prove to be the most important challenge ever to face any industry in this Nation."

Clifford F. Hood, president, U. S. Steel Corp.

Mines Bureau Research

"In the public interest, conservation has been the principle objective of the bureau's research program throughout the years. An important part of this program is directed toward obtaining fundamental facts on the chemical and physical properties of the coal resources of

Continued on p 208

ALL-TRUCK BUILT to save you the BIG money!

There's this vital difference between INTERNATIONAL and other trucks:

Of the 5 leading makes, only INTERNATIONAL builds a complete line of models that are *all-truck* . . . with no automobile parts asked to do a truck job.

This means that INTERNATIONALS, with all their comfort and ease of handling, are engineered and built to give you a longer lifetime of more constant service . . . with less time *off* the job, more time *on* the job, and fewer repair bills along the way. They save you the *big* money . . . the operation and maintenance money.

The proof is in the records of cost-conscious operators . . . and in sales records, too. INTERNATIONAL has led in heavy-duty sales for 23 straight years . . . in "6-wheel" sales 20 straight years . . . in "multi-stop" sales 17 straight years!

Let your INTERNATIONAL Dealer or Branch give you complete facts on the right truck for your job . . . all-truck built to save you the BIG money.

INTERNATIONAL HARVESTER COMPANY • CHICAGO

INTERNATIONAL® TRUCKS

All-Truck built to save you the BIG money!

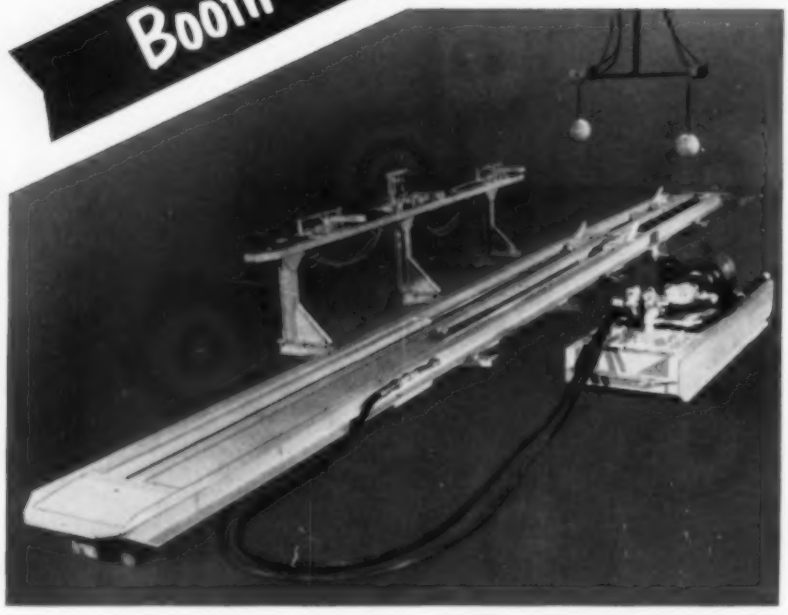
International Harvester Builds **McCORMICK®** Farm Equipment and **FARMALL®** Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

Top TV comedy! Ronald Colman and Benita Hume in "The Halls of Ivy," CBS-TV, Tuesdays, 8:30 p.m., EST

See It at the COAL SHOW!

STAMLER LOADING POINT EQUIPMENT

Booth 1609



The STAMLER Automatic CAR SPOTTER

•

The STAMLER Automatic LOADING STATION

•

The STAMLER "Shortie" CAR SPOTTER

★ HYDRAULIC

★ AUTOMATIC

★ TESTED

★ PROVEN

DON'T miss seeing the complete line of STAMLER Loading Point EQUIPMENT at the Coal Show! We'll be there in Booth 1609 and we'll be looking for you! You'll see equipment that will save you time and money! You'll see equipment that is tried and proven . . . *ordered and re-ordered!*

The STAMLER All-Hydraulic AUTOMATIC LOADING STATION — in combination with the STAMLER Hydraulic Barney CAR SPOTTER — will perform *completely unattended* all operations necessary for maximum loading of your cars *uniformly* without spillage! It is the only successfully manufactured production item of its type! And the fact that Stamler Equipment is all-hydraulic means almost no maintenance and less possibility of failure due to faulty contacts or from coal dust and moisture.

See the efficient, money-saving STAMLER EQUIPMENT at the Show and you'll agree that there's nothing like it.

W. R. STAMLER CO. PARIS KENTUCKY

SCHROEDER BROS., *Exclusive Eastern Sales Agent*, PITTSBURGH, PA.

UNION INDUSTRIAL CORP., CARLSBAD, NEW MEXICO • SALMON & CO., BIRMINGHAM, ALA.

for better Coal Preparation . . .

SYMONS® "V" SCREENS

. . . FOR DEWATERING

. . . FOR SIZING

. . . FOR DEDUSTING

An entirely new screening principle gives the Symons "V" Screen unequalled high capacity for wet or dry applications, especially in the more difficult to screen finer sizes. The screening principle employs controlled diffused feed and vertical flow of material, with a low rotary speed and high speed gyratory action, combining centrifuge and gravitational force.

Numerous Symons "V" Screen dewatering installations have proved that the centrifugal action of this unit produces a much dryer product with less degradation than conventional dewatering methods. *Mail the coupon for further information.*

Nordberg Mfg. Co., Milwaukee, Wis.

SYMONS . . . A REGISTERED NORDBERG TRADEMARK KNOWN THROUGHOUT THE WORLD

On Display at the 1955 COAL SHOW

PUBLIC AUDITORIUM

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CLEVELAND MAY 16-19

NORDBERG MACHINERY

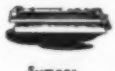
NORDBERG

SYMONS SCREENS NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • DULUTH • WASHINGTON
TORONTO • MEXICO, D.F. • LONDON • JOHANNESBURG

OTHER SYMON SCREENS



Symons Horizontal Screens

Symons Bar Grizzlies

Symons Rod Deck Screens

Symons Rod Grizzlies

MAIL THIS COUPON TODAY

NORDBERG MFG. CO. CA
Milwaukee, Wisconsin

Please send me further information on the following screens for coal preparation service:

☐ Symons "V" Screens ☐ Symons Rod Deck Screens
☐ Symons Horizontal Screens ☐ Symons Grizzlies

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

© 1955, Nordberg Mfg. Co. S155

CLEVELAND
WE'RE ALL ACOMING—
Why don't you all come to see us at the American Mining Congress Coal Show (Whew! mighty fancy handle). Hear tell its gonna be in Cleveland again. Now that's a right nice town—Genuine Buckeye hospitality—We Boys from Illinois are going to be asettin in Booth 920 and we sure would like to chew the fat with you for awhile. Why are we gonna be there? Well we got ourselves a making a Crusher that's downright popular—and Coalmen, can it crush coal? We're gonna have one of these contraptions in our booth and we're inviting you Folks to come see it run—Yep it'll be driven with a ¼ Horse Motor, Honest. Its gonna be painted a real bright fire engine red. We'd like you all to come and purty up the place and examine dis machine from bottom to tops. If you have a hankerin' for facts (Technical data as those engineerin' folks call it) our gang will be able to toss a plenty at you. Now you all come to the Main Exhibit Hall, Booth 920. Leave your shootin' irons at home cause all the people that's a gonna be there will be friendly mine folks like yourselves.
See you all.
YIPPIE!
CLEVELAND
BELLEVILLE
T. J. GUNDLACH MACHINE CO.
226 CENTREVILLE
BELLEVILLE, ILLINOIS

NEFF & FRY Bin is fume stack for coal dryer

Seems like an odd use for a storage bin, doesn't it?

Fact is, our bins are extensively employed as stacks and chimneys. Being hollow structures, they admirably serve the purpose. What's more, they have the stability and endurance to stand up and take it.

The stack illustrated is 16 ft. inside diameter and 42½ ft. high. Fumes enter near the bottom. Close to the top is a perforated ring which sprays a fine mist of water across the stack. The fogging process precipitates dust and absorbs noxious gases, reducing contamination of the surrounding atmosphere.

Excess water drains from the bottom of the stack. Through a door in the hollow pedestal, sludge is removed from time to time.

The photo was taken while the coal preparation plant was being built.

If you want to know more on this subject, write or phone us.

THE NEFF & FRY CO. • 228 Elm St., Camden, Ohio

NEFF & FRY ➧ SUPER-CONCRETE STAVE STORAGE BINS

the United States which are useful both to government and to industry. The bureau's research program is devoted largely to fundamental and long-range research that may not be particularly attractive to commercially supported organizations. In general, the following projects represent research activities of the type that have been favored in the Bureau of Mines programs:

"1. Determination and publication of the chemical and physical properties of American coals, including tests for evaluating combustion, carbonization, gasification, liquefaction, and yields of chemical products.

"2. Development and standardization, in cooperation with other agencies, of methods of sampling, analysis and testing.

"3. Research and engineering testing relating to coals and boiler plants belonging to or for the use of the government.

"4. Study of mining methods with the objective of improving the safety of workers and improving the recovery of coal.

"5. Research and development of engineering data on preparation of American coals.

"6. Prevention of gas and dust explosions in coal mines.

"7. Reduction of stream pollution from mine waters and waste waters from washeries and coal-processing plants through the development of practical methods of minimizing these wastes without imposing onerous costs on the industry.

"8. Improvement in the smokeless combustion of bituminous coal and in the processes for producing smokeless fuel from coal."

Louis C. McCabe, chief, division of solid fuels, U. S. Bureau of Mines.

Chemicals From Coal

"What I know concerning this business does not tempt me to predict that you, as coal producers, may anticipate any great increase in tonnage in the foreseeable future merely to produce much-needed coal chemicals." The limiting factor to date is dependency on steel-plant coke-oven production of the necessary ingredients, and while coke production will grow it will not be in leaps and bounds. And processing will be improved and modified to increase the yield of certain chemicals but still within the limits of coke-oven capacity.

"The question naturally arises: 'Is there any hope of coal chemicals breaking out of that restricting pattern and providing a greater and more direct market for utilization of coal to produce chemicals?' That, of course, would be box-office stuff for you in the coal industry. The answer to this question is 'Yes,' but I can't tell you when it will happen." Coal hydrogen, coal gasification and low-temperature carbonization are the possible approaches. Some of the products, if they could compete with products from other sources, would represent major new coal markets.

Fred C. Foy, president, Koppers Co., Inc.

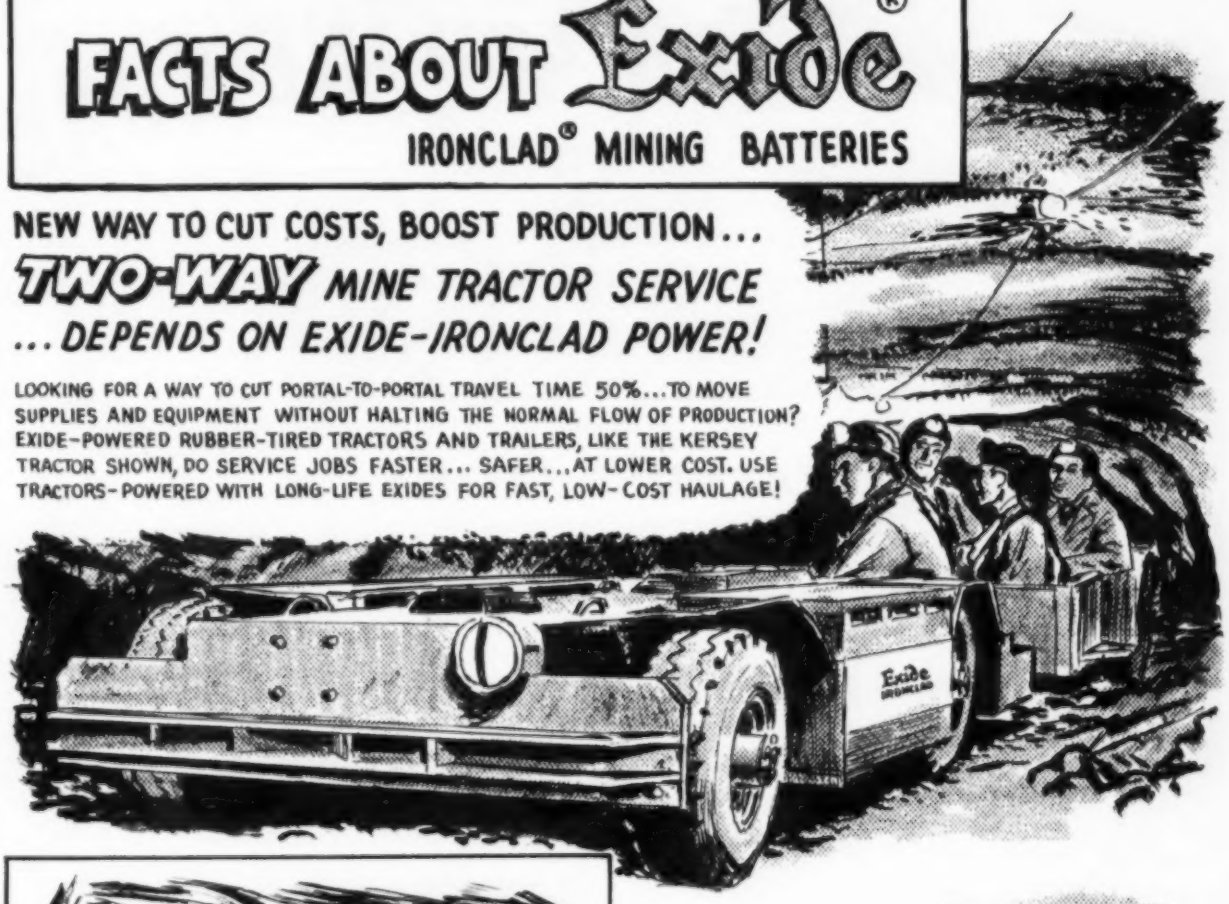
FACTS ABOUT Exide®

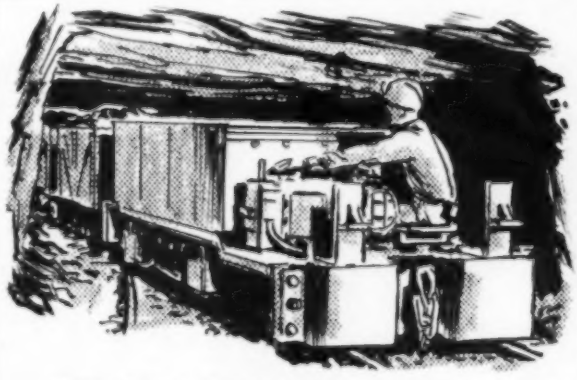
IRONCLAD® MINING BATTERIES

NEW WAY TO CUT COSTS, BOOST PRODUCTION...

TWO-WAY MINE TRACTOR SERVICE ...DEPENDS ON EXIDE-IRONCLAD POWER!

LOOKING FOR A WAY TO CUT PORTAL-TO-PORTAL TRAVEL TIME 50%...TO MOVE SUPPLIES AND EQUIPMENT WITHOUT HALTING THE NORMAL FLOW OF PRODUCTION? EXIDE-POWERED RUBBER-TIRED TRACTORS AND TRAILERS, LIKE THE KERSEY TRACTOR SHOWN, DO SERVICE JOBS FASTER... SAFER...AT LOWER COST. USE TRACTORS-POWERED WITH LONG-LIFE EXIDES FOR FAST, LOW-COST HAULAGE!



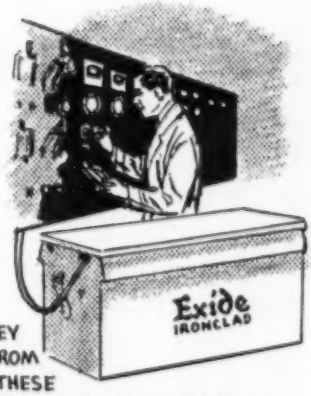


MORE TRIPS PER SHIFT! WITH DEPENDABLE EXIDE-IRONCLADS...

CAR CHANGES ARE SPEEDED, LOADERS KEPT BUSY, AND HAULAGE MOVES FAST WHEN LOCOMOTIVES ARE POWERED WITH EXIDE-IRONCLADS. EQUIPMENT WORKS FULL-SHIFT, DOWN-TIME IS ELIMINATED. YOU GET MORE PRODUCTION PER MAN-HOUR WITH LESS COST PER TON HANDLED. DEPENDABILITY AND LONG USEFUL LIFE MAKE EXIDE-IRONCLADS YOUR BEST POWER BUY-

AT ANY PRICE!

WORKED TO DEATH TO LEARN SECRET OF LONGER LIFE...



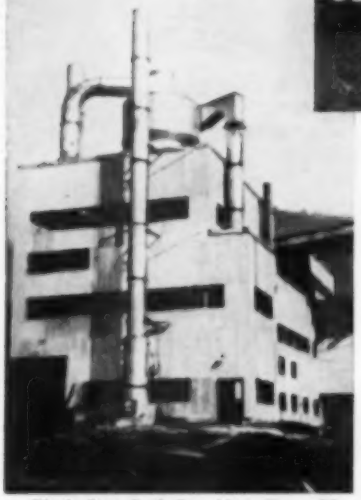
LAB TESTS OF IRONCLADS AGAINST CONVENTIONAL BATTERIES SHOW THAT THEY PERFORM BETTER... HAVE FROM 20% TO 30% LONGER LIFE! THESE FACTS, DEMONSTRATED BY THOUSANDS OF BATTERY USERS, EXPLAIN WHY EXIDE-IRONCLADS ARE YOUR BEST MINING BATTERY BUY-**AT ANY PRICE!** SINCE 1910, RESEARCHERS HAVE GREATLY IMPROVED EXIDE-IRONCLAD PERFORMANCE AND USEFUL WORKING LIFE, BUT THE BASIC IRONCLAD PRINCIPLE OF TUBULAR CONSTRUCTION REMAINS THE SAME.

LET EXIDE HELP SOLVE YOUR MINING BATTERY PROBLEMS. ❶ CALL AN EXIDE SALES ENGINEER FOR FULL DETAILS. ❷ WRITE FOR FORM 1982, A MANUAL ON MAINTAINING MOTIVE POWER BATTERIES.

Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

Flash Drying FINE COAL

175 tons per hour of ¼" x 0 coal dried from 8% to 2% moisture with multiple drying column in western Pennsylvania plant.



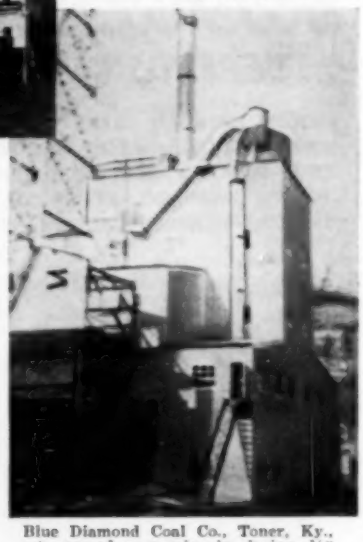
Black Star Coal Co., Alva, Ky., with single column Flash Dryer produces two grades: 45 tons per hour of ¼" x 28-mesh, and 15 tons per hour of 28-mesh coal with final moisture content of 2%.

RAYMOND SYSTEM

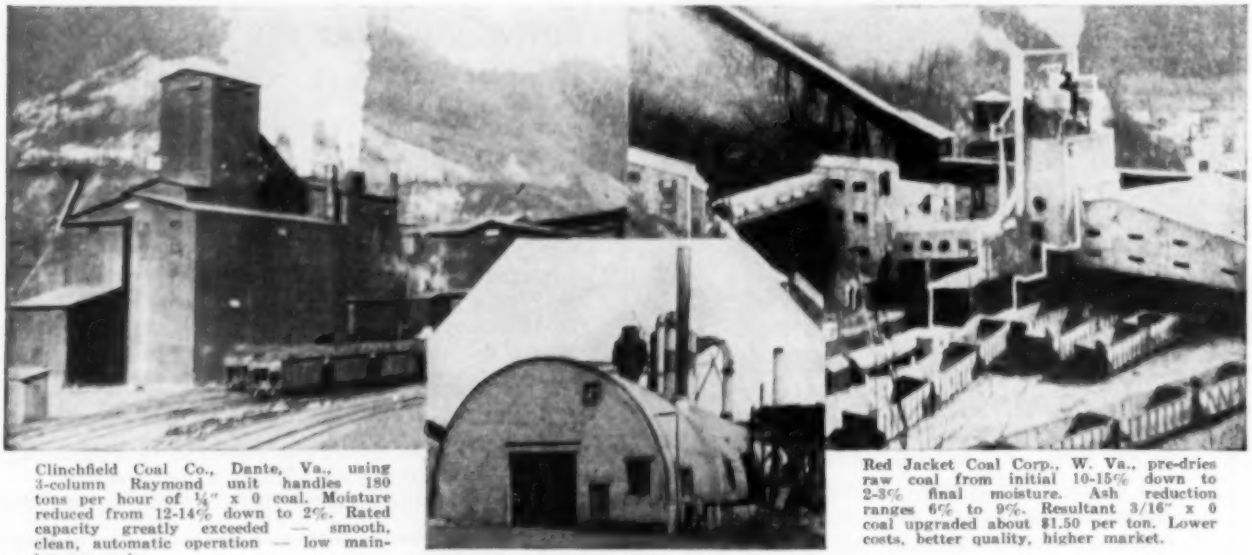
These typical installations exemplify the superior results obtained with the modern C-E Raymond System of Flash Drying. Constant developments and new advances in Flash Drying operations assure utmost efficiency in producing fine coals from 3/8" and below in particle size.

The instantaneous drying action and new type coal trap, combine to eliminate the coal degradation problem even in the softer coals. By means of a wet scrubber device, air pollution around the plant is kept well below all local ordinance restrictions.

C-E Raymond Flash Drying is simple, efficient and flexible in its application to various types of coal and in large or small capacity plants.



Blue Diamond Coal Co., Toner, Ky., sets record economies in drying ¼" x 0 fine coal from 10% to 2% final moisture content. Single column Flash Dryer has 75 tons per hour capacity.



Clinchfield Coal Co., Dante, Va., using 3-column Raymond unit handles 180 tons per hour of ¼" x 0 coal. Moisture reduced from 12-14% down to 2%. Rated capacity greatly exceeded — smooth, clean, automatic operation — low maintenance costs.

Typical small-capacity Raymond unit at Kuesel Coal Company is flash drying 15 tons per hour of fine coal to less than 3% moisture.

Red Jacket Coal Corp., W. Va., pre-dries raw coal from initial 10-15% down to 2-3% final moisture. Ash reduction ranges 6% to 9%. Resultant 3/16" x 0 coal upgraded about $1.50 per ton. Lower costs, better quality, higher market.

For further details, ask for Bulletin FD-51

COMBUSTION ENGINEERING, INC.

Raymond Division

1315 NORTH BRANCH ST., CHICAGO 22, ILLINOIS

SALES OFFICES IN PRINCIPAL CITIES

IMPOSSIBLE WITHOUT EXPLOSIVES

On a mountainside in West Virginia, overburden up to 80 feet in height—sandstone, shale, and slate—is blasted with the correct type of Hercules® dynamite to uncover seams of coal 7 ft. thick. Speedy, economical shovel-loading operations are maintained by loosening the coal with small charges of explosives.

Hercules has long pioneered in developing explosives for every type of project. Our experience and service facilities can help you solve blasting problems in mining, quarrying, construction, seismic explorations—wherever explosives are needed to get a job done.

HERCULES POWDER COMPANY
INCORPORATED

Explosives Department, 936 King Street, Wilmington 99, Delaware

Birmingham, Ala.; Chicago, Ill.; Duluth, Minn.; Hazleton, Pa.; Joplin, Mo.; Los Angeles, Calif.; New York, N. Y.; Pittsburgh, Pa.; Salt Lake City, Utah; San Francisco, Calif.

HERCULES

HERCULES CORDIALLY INVITES YOU TO VISIT ITS SUITE AT THE HOTEL STATLER DURING THE COAL CONVENTION

XR55-4

MILLIONS OF YARDS

2 MANITOWOC 4500's strip 3½ million yards of overburden per year for Hart and Hart, Providence, Ky.

It takes plenty of mechanical muscle to move millions of yards of tough overburden — 95% of which was rugged rock and shale!

These two big Manitowocs — a 4500 high-lift 5½ yd. shovel and a 4500 Dragline with 100′ boom — powered their way through 80′ of this rough going 24 hours a day, six days a week, all year long. Between them, these big workers uncovered over 478,000 tons of coal!

In addition to tremendous power, Manitowocs have the fast travelling speeds, the maneuverability, the operating speeds, and the stamina it takes to turn out big production on even the toughest jobs. These outstanding features — plus a minimum of down-time — mean profitable operation on every job! Get all the facts on Manitowoc. Manitowoc Engineering Corp., Manitowoc, Wis.

MANITOWOC

SHOVELS 1-5 YD. Speedcrane CRANES 20-100 TON

Now-out of Chrysler Corporation...come the most rugged trucks ever built!

Announcing new Dodge "Job-Rated" Trucks!

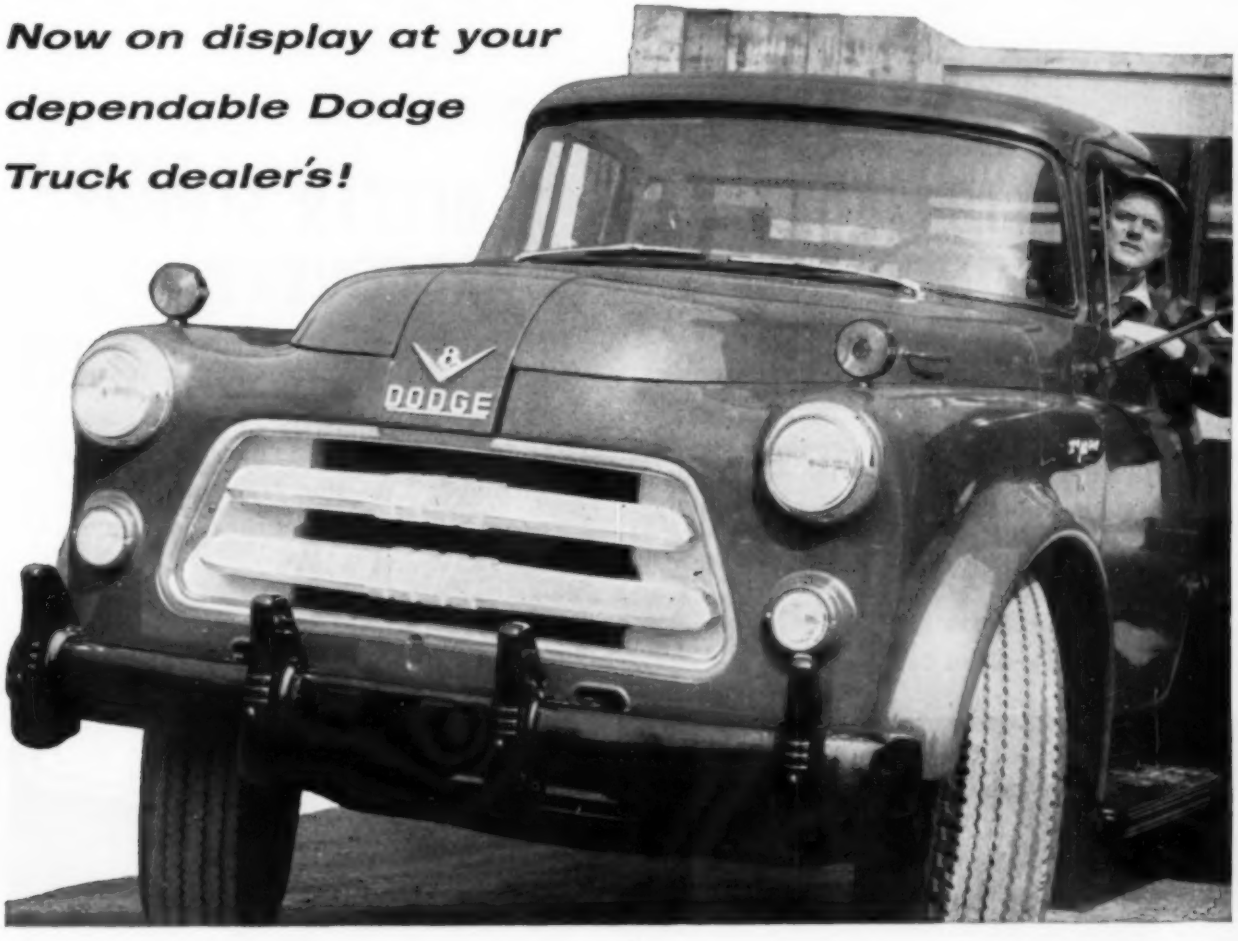
The power line with full view design!

NEW! Super Power-Dome V-8 engines—169 to 202 hp.—the world's most powerful low-tonnage V-8's—and the most dependable sixes!

NEW! Full-view design with biggest wrap-around windshield of any make! Wrap-around rear window available, too! You get greater safety, easier handling!

NEW! Higher payloads, new no-clutch transmissions, power steering and braking, fuel-saving overdrive! Plus smartly-styled interiors, colors, 2-toning! Over 100 new features!

Now on display at your dependable Dodge Truck dealer's!



CONTINUOUS CENTRIFUGAL...

means

1 BETTER COAL DRYING

...so much better, in fact, that C-M-I Dryers are piling up new records for economy and efficiency in preliminary dewatering operations.

...so much better that C-M-I Dryers are not only replacing costly heat drying in preliminary dewatering but, in many cases, are eliminating entirely the need for heat drying.

2 BETTER SLURRY RECOVERY

Marketable coal—thousands of tons of it—is being reclaimed from slurry by C-M-I Continuous Coal Dryers ..... at a cost so low as to make this operation extremely profitable. Yes—slurry reclamation CAN be profitable—when done the C-M-I way. Find out HOW and WHY ...

Booth #313
Cleveland Coal Show

SEND FOR FREE BROCHURE

CENTRIFUGAL & MECHANICAL INDUSTRIES, INC.
146 PRESIDENT ST. · ST. LOUIS 18, MO.

LIMA Type 1201 shovel and Type 1201 dragline stripping coal. The Type 1201 is equipped with a 24'-6" boom, 18'-0" dipper handle and 3½ cu. yd. dipper. The Type 1201 has gained world-wide recognition for its dependable performance and big output at low operation and maintenance cost.

LIMA'S fast service cuts costly downtime

From coast-to-coast Lima service engineers, warehouses and distributors are prepared to give you that extra-fast service or parts delivery which can make all the difference between continuous, profitable production and high-cost idleness of equipment.

When you buy a LIMA you can depend on long, trouble-free service, thanks to those extra quality features built into every LIMA. But if trouble happens and you need help, you get it from Lima . . . fast!

COMPARE QUALITY! No other machine gives you as much as LIMA!

1. Piston ring type dirt seal rings and retainers in crawler rollers.
2. Moving parts are flame or induction hardened for longer life.
3. Main machinery is placed well back of center of rotation.
4. Anti-friction bearings at every vital bearing point.
5. Big capacity drums and sheaves are easy on cables.
6. Propel and swing gears and power take-off are enclosed in a sealed oil bath.
7. Torque converter (optional on certain types).
8. Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts to keep your LIMA on the job continuously.

COMPARE and you'll specify LIMA for shovels (to 6 yds.), cranes (to 110 tons) and draglines (variable). Smaller capacities available on rubber.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

BALDWIN BLH LIMA-HAMILTON

LIMA SHOVELS · CRANES · DRAGLINES · PULLSHOVELS

BALDWIN-LIMA-HAMILTON

Construction Equipment Division · LIMA · OHIO · U. S. A.

Suspended magnet solves tramp iron problem on high-speed conveyor handling wet coal

See Us At
The Coal Show
Booth No. 141
May 16-19
Cleveland, Ohio

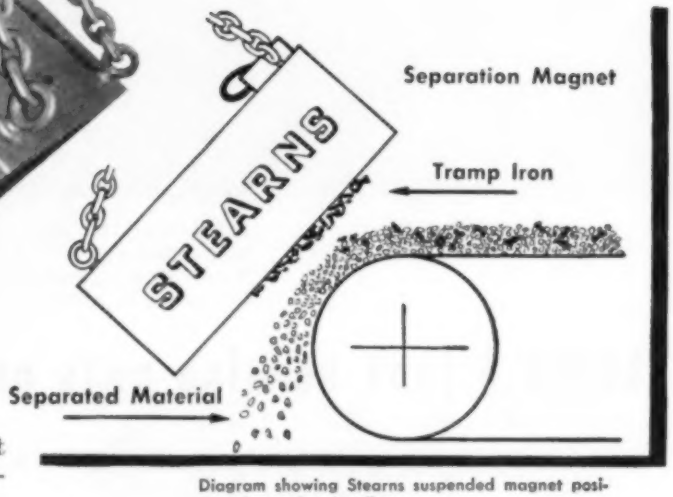


Diagram showing Stearns suspended magnet positioned over head pulley.

Stearns rectangular suspended separation magnet cures tramp iron headaches on fast-moving conveyors, particularly when material is wet.

First, the magnet's length permits its powerful, deep pulling force to work over a large area . . . dig out embedded tramp iron . . . prevent "sneak throughs." Second, the upward movement of iron to the magnet, shakes off wet, clinging material, eliminating costly waste.

Greater Flexibility

Stearns suspended magnet overcomes space limitations because it can be placed over the head pulley, or anywhere along the belt. Sometimes it's set up to remove tramp iron before material moves onto the conveyor — thus safeguarding the belt from damage. In many processing operations, Stearns suspended magnets are used ahead of magnetic pulleys to insure double protection for crushers and other expensive equipment.

Custom-Built

Magnetic specialists at Stearns design and build rectangular or circular suspended magnets, electro or permanent magnetic pulleys in standard sizes, or to your individual specifications. Get complete details from your Stearns representative or write for bulletin 25D.

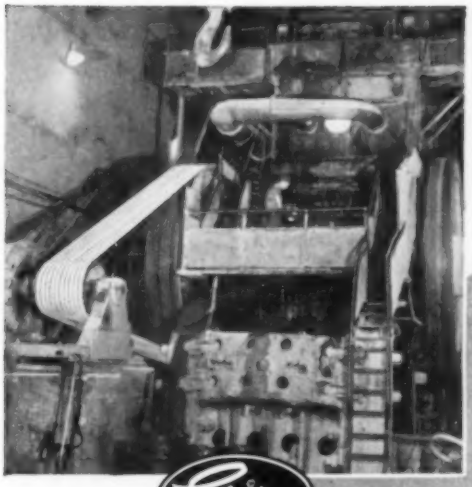
Check these advantages

- All-welded, moisture-proof construction
- No moving parts that require replacing
- Single coil construction for magnetic field stability
- Leads and terminals fully protected against abrasion
- Vacuum-impregnated windings for long life, dependable operation

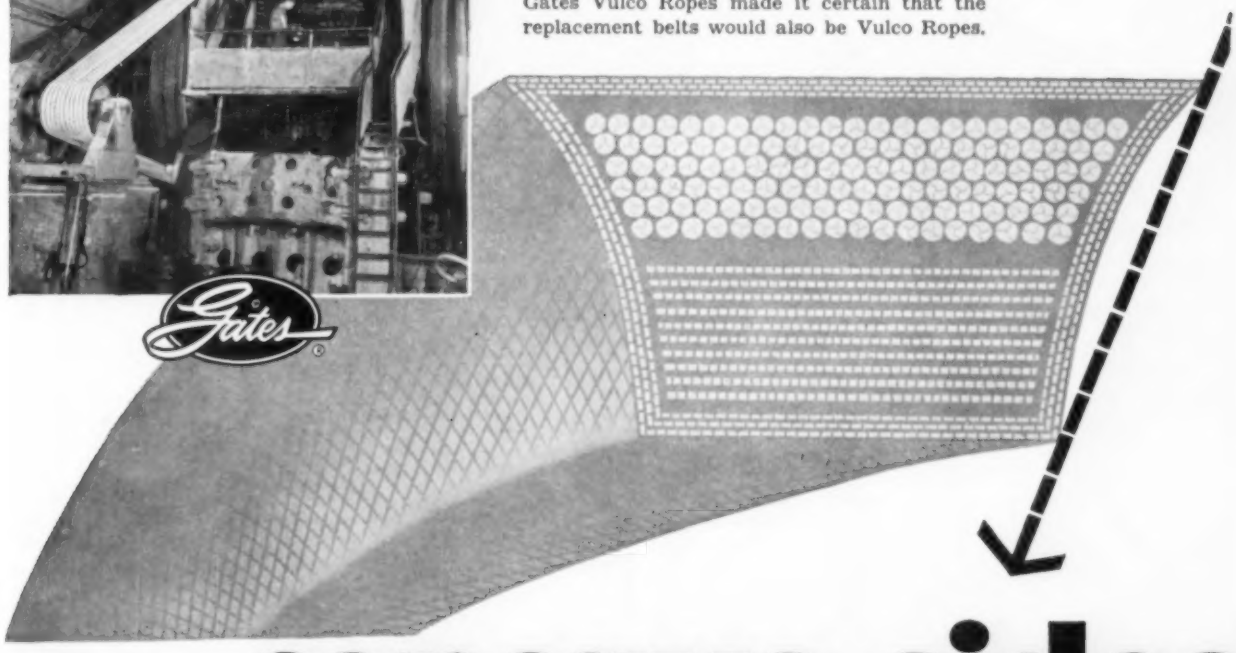
MAGNETIC EQUIPMENT FOR ALL INDUSTRY

STEARNS MAGNETS

STEARNS MAGNETIC, INC., 661 S. 28th St., Milwaukee 46, Wis.



The drive on this huge jaw crusher was changed to Gates Vulco Ropes 12 years ago. 35 million tons of ore were crushed before the belts were replaced. The trouble-free performance of these Gates Vulco Ropes made it certain that the replacement belts would also be Vulco Ropes.



How concave sides cut V-belt costs!

Plants all over the world have made this discovery: Gates Vulco Ropes—the V-belts with *concave sides*—wear longer; cost less per year of service.

Here is the interesting reason why:

When the Gates Vulco Rope is bent around the sheave, the *precisely engineered* concave sides (Fig. 1) fill out and become straight (Fig. 1-A). Thus the belt makes full, uniform contact with the sides of the pulley. You get sure pulling power and *even distribution of wear.*

Longer wear saves not only on replacement costs; it also saves the cost of down-time... keeps equipment producing.

It's easy to prove to yourself the value of concave sides

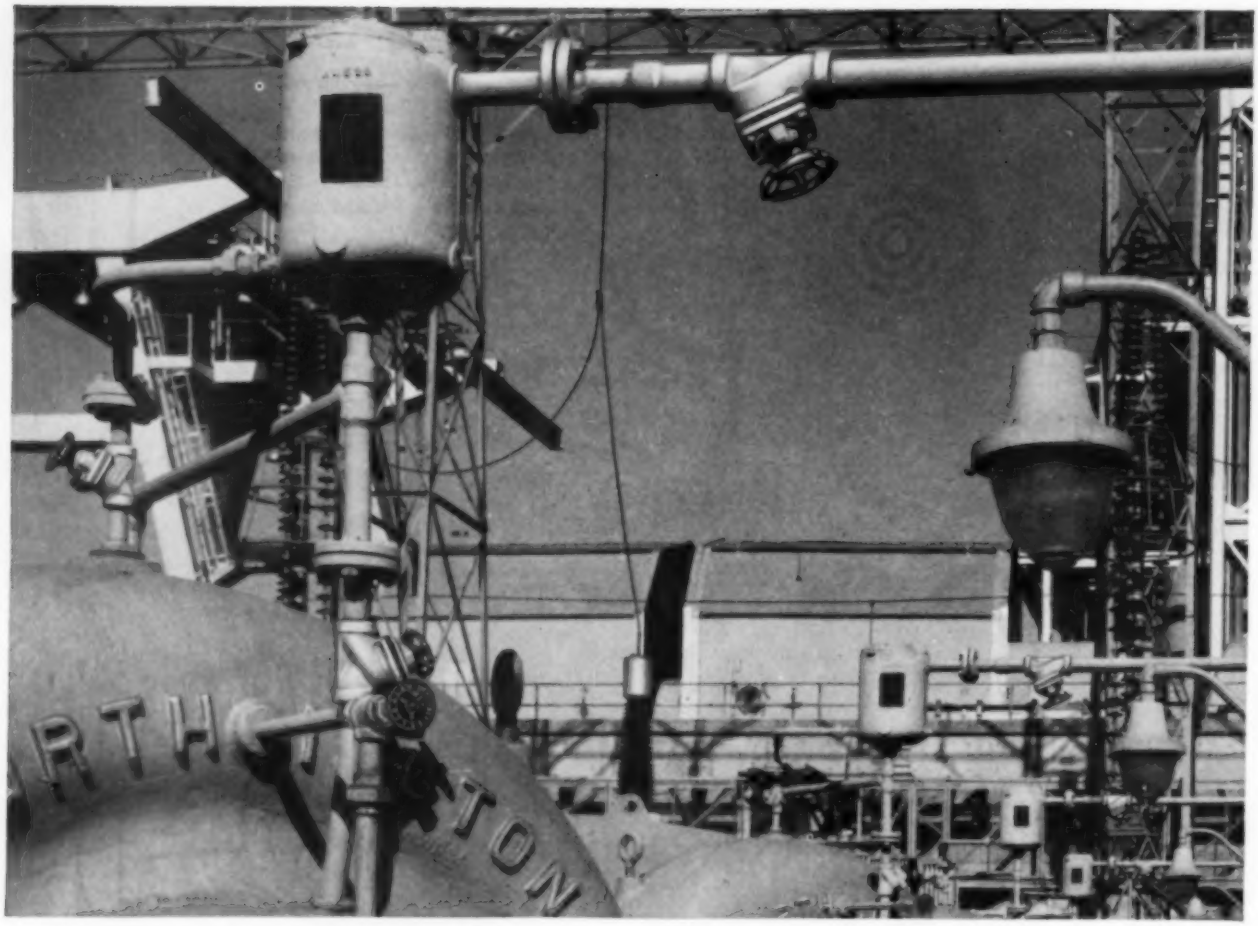
Simply bend a straight-sided belt (Fig. 2) and *feel* the bulge at the sides around the bend. You will quickly see why the bulging sides prevent an even fit in the pulley groove (Fig. 2-A). Uneven contact shortens belt life...increases belt costs.

Cut belt replacement time and costs...specify Gates Vulco Ropes—the V-Belt with *concave sides* (U.S. Pat. 1813698). The Gates Rubber Co., Denver, Colorado—*World's Largest Maker of V-Belts.*

Gates Engineering Offices and Distributor Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

TFA-50-B

GATES VULCO ROPE DRIVES



Corrosive circulating water tamed here by these CRANE VALVES

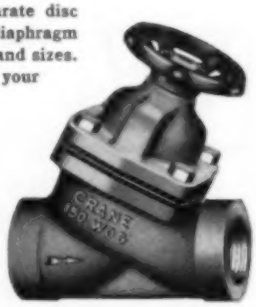
THE CASE HISTORY—Almost 2 years' operation without any maintenance of valves on circulating water lines to condensers, and on priming and instrumentation systems—with no trouble in sight. That's the experience of Southern California Edison Company's 280,000 k.w. steam station at Etiwanda with Crane Packless Diaphragm Valves.

The plant's engineers knew that sediment in recirculated water would quickly cut out the seats in ordinary valves and its corrosive elements would attack working parts to make valve operation difficult.

Not so with Crane Packless Diaphragm Valves. Their sealed bonnet keeps working parts out of contact with line fluid—free of corrosive effects. Separate disc construction with pliable insert resists erosion—seats tightly even on foreign particles. Large or small, these valves operate easily with fewer turns to the cycle. Typical Crane quality throughout—they're made better to do the job better—a bigger value for the thrifty buyer.

CRANE No. 1610 PACKLESS DIAPHRAGM VALVES

No packing to maintain. Neoprene diaphragm has longer life because it seals the bonnet only—is not subject to the cutting and crushing encountered when also required to do the seating. Separate disc gives control of fluid even should diaphragm fail. Wide selection of materials and sizes. Write for folder AD-1942 or see your Crane Representative.



CRANE CO.

General Offices: 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas

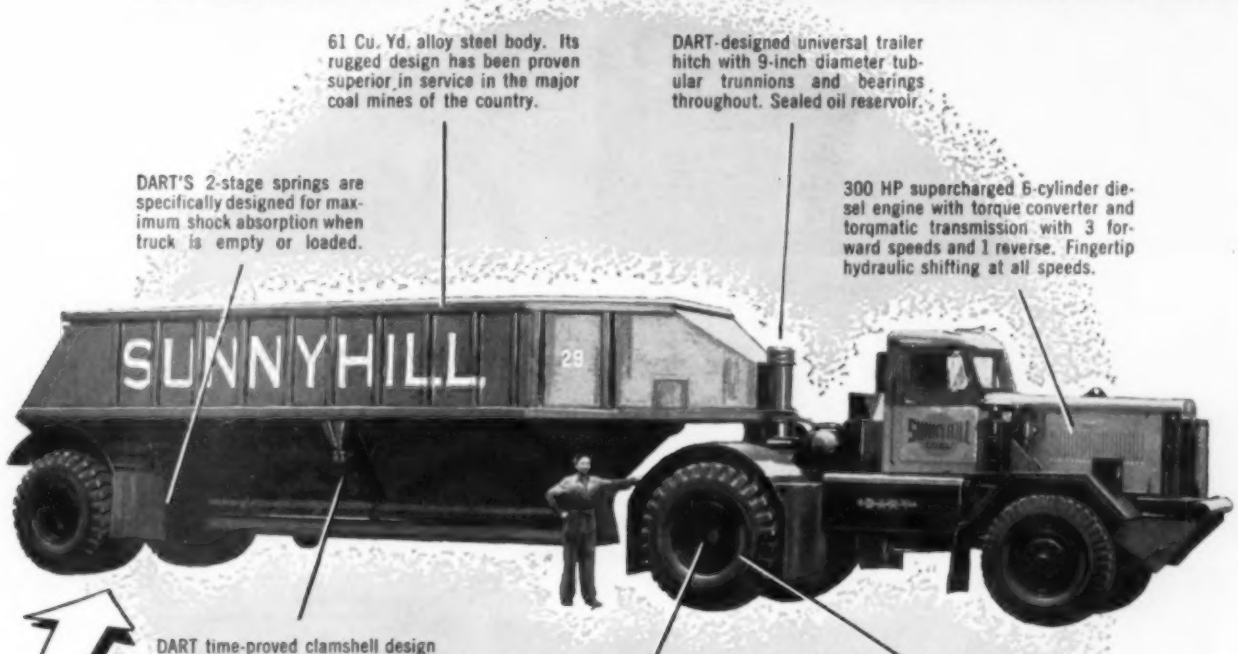
VALVES • FITTINGS • PIPE • KITCHENS • PLUMBING • HEATING

CRANE'S FIRST CENTURY . . . 1855-1955

AFTER 2 YEARS SERVICE AT SUNNYHILL

SEE THIS DART COAL HAULER

Study Its Remarkable Performance Records Available For Review at the Cleveland Coal Show



61 Cu. Yd. alloy steel body. Its rugged design has been proven superior in service in the major coal mines of the country.

DART-designed universal trailer hitch with 9-inch diameter tubular trunnions and bearings throughout. Sealed oil reservoir.

DART'S 2-stage springs are specifically designed for maximum shock absorption when truck is empty or loaded.

300 HP supercharged 6-cylinder diesel engine with torque converter and torqmatic transmission with 3 forward speeds and 1 reverse. Fingertip hydraulic shifting at all speeds.

DART time-proved clamshell design doors are air-operated and controlled by a valve in the cab. Air cylinders are double acting for fast and positive action.

33 1/3% greater braking area. Brakes on tractor and trailer are of double-shoe design—lining 9" wide by .75" thick—Drum diameter 20". Brake lining area 860 sq. in. per axle. Air operated.

DART D-75-S 100,000 lb. capacity, double reduction rear axle, the strongest axle made today. Nickel alloy cast steel. Larger oversize bearings assure greater radial and thrust capacities.

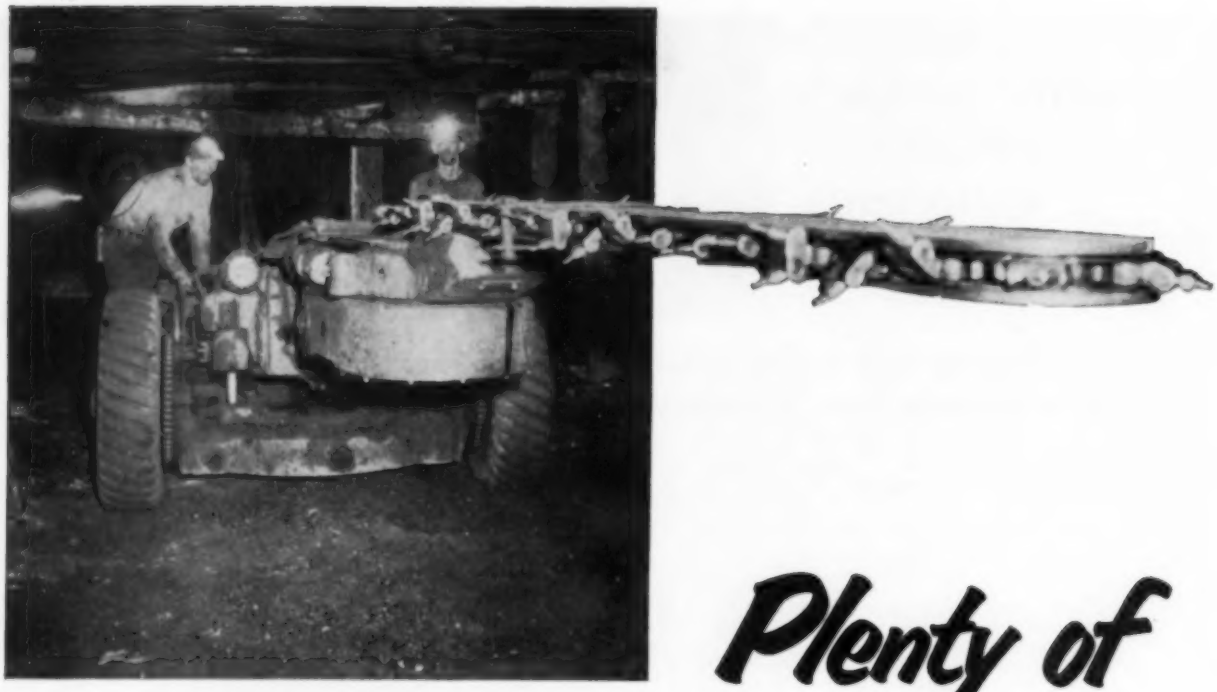
New! TURBODIESEL by Cummins. Turbo-charging harnesses the exhaust gas energy normally wasted, resulting in higher H. P. output without increasing engine size or displacement.

Two years ago . . . in May of 1953, DART #29 was exhibited at the COAL SHOW in Cleveland prior to its delivery to Sunnyhill Coal Company. This year, AFTER its two years of service the same truck will be exhibited again . . . along with complete facts regarding its performance.

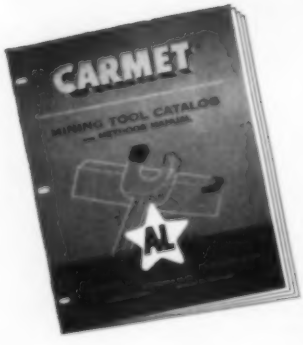
Prior to modernizing with a fleet of 10 DART COAL HAULERS two years ago, Sunnyhill used 30 trucks. Today its production tonnage shows an increase over two years ago and truck and road maintenance costs are substantially reduced. For the complete story, write or see us at Booth 1552 at the Coal Show.

FIRST SHOWING!
GOODYEAR TUBELESS TIRES
In Size 18:00 x 25—28 ply (all Nylon)

DART TRUCKS
Kansas City 8, Missouri
SUBSIDIARY OF THE CARLISLE CORPORATION



Plenty of Mining Experience behind these Carbide Bits



Write for your copy of the CARMET MINING TOOL CATALOG

This informative 16-page booklet gives complete data, sizes, etc. on all styles of Carmet carbide-tipped cutter and drill bits. Also included is a valuable methods manual on reconditioning methods and equipment. Your copy gladly sent free on request.

ADDRESS DEPT. CA-65

Carmet carbide bits were developed and proved *the hard way* . . . through years of service in every conceivable mining condition and in every mining area. Case histories vary considerably due to local conditions—but no matter what your cutting or drilling problems may be, we can show you records of superior performance by Carmet bits under similar circumstances.

As a direct result of this field-proved background, Carmet bits offer you several distinct advantages. One is the unusually wide range of selection: 20 different styles of cutter bits, 2 styles of finger bits, 2 styles of roof bolting bits, 3 styles of auger bits. More bits to pick from means a closer match with *your* conditions—means savings for you in time and bit costs. Another advantage was *pioneered* by Carmet . . . it's the overlaying cap of steel that double-bonds each carbide cutter tip firmly in its seat, guarding against tip loss and reducing side drag and power consumption.

How about giving Carmet bits a trial? Both we and your local distributor will be glad to cooperate with you. ***Allegheny Ludlum Steel Corp., Carmet Div., Wanda and Jarvis Aves., Detroit 20, Michigan.***

The Original DOUBLE-BONDED Carbide Bit

CARMET® AL

TWAD 8444

THIS AMSCO® LIP TAKES A SHARPER BITE

. . . chews out full loads at normal power

The lip juts way out where it easily bites up—and delivers—the full yardage of coal. It's a sharp *extension* of the dipper, with fanned teeth—for fast, easy penetration. The dipper digs out a heavier load without strain on the shovel . . . even requires less power, and prolongs life of all parts.

This Amsco lip lasts a long, long time, because it's made of the toughest steel known—manganese steel—the metal that work-hardens to fight off wear by impact and abrasion. Lip replacement is simple, when necessary, keeping downtime short.

If getting more pay loads moved faster with less wear on equipment means more profits to you, *specify Amsco Renewable Lip Dippers.*

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

"CONTINUOUS" HAULAGE

FOR "CONTINUOUS" MINING

ENTERPRISE HAULAGE EQUIPMENT

MINE CARS (4-Axle Cars, Thru-Axle Cars, 8-Wheel Cars)

- End Dump Cars
- Side Dump Cars
- Bottom Dump Cars
- Rotary Dump Cars

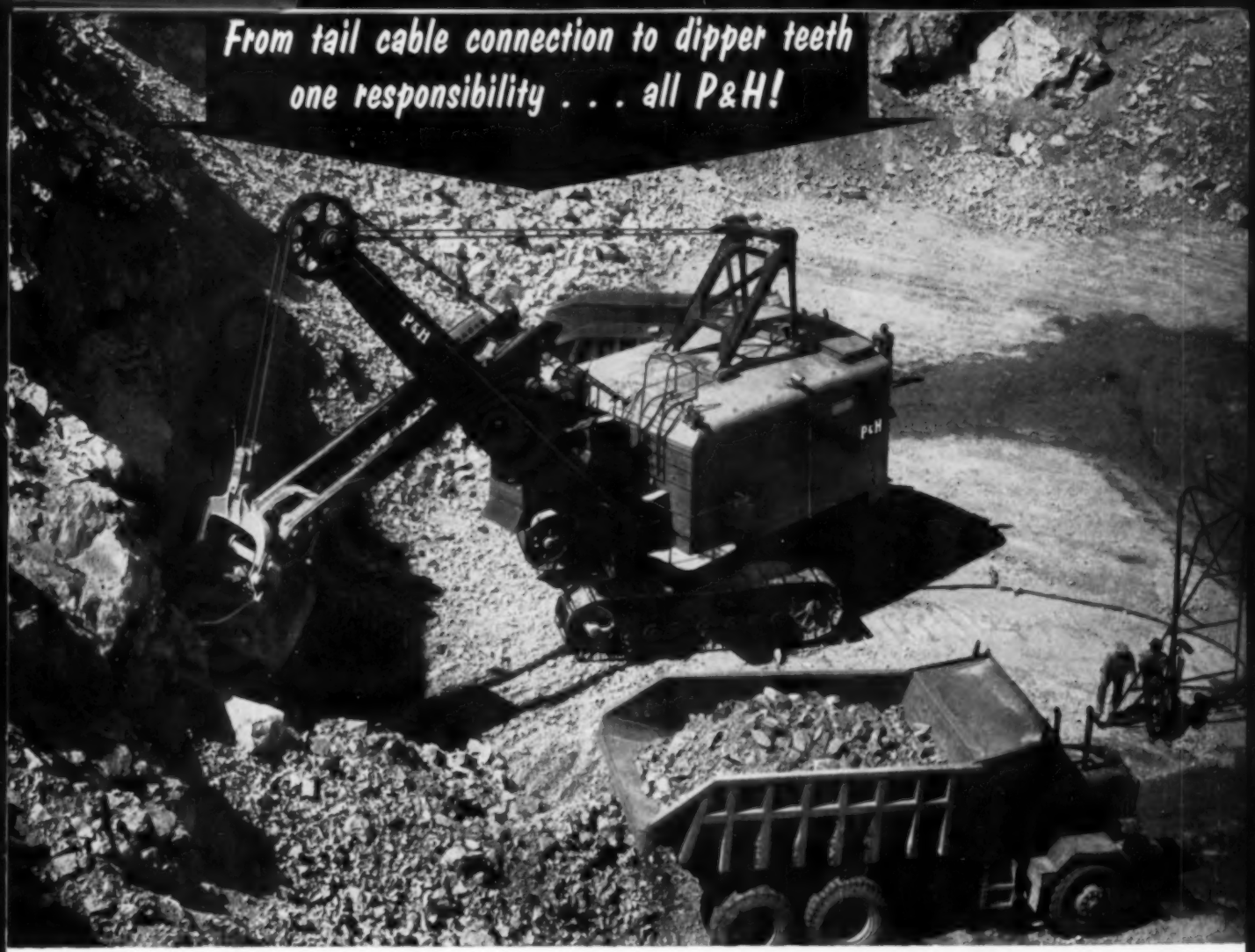
EQUIPMENT HANDLING CARS

MAN-TRIP CARS

"Your cars custom-engineered for your specific needs"

ENTERPRISE WHEEL & CAR CORPORATION

BRISTOL, VA.-TENN. • HUNTINGTON, W. VA.



See Electronic Control in action at the Coal Show
. . . see P&H at Space 119.

How P&H ELECTRIC SHOVELS cut tonnage costs with these two great features:

ELECTRONIC CONTROL — provides marked advantages over any other type of control available on electric shovels today. It's far easier, of course, and completely effortless. *Fatigue factor at end of shift is hardly discernible.* Response is faster. It is applied to all operating functions and arranged so the operator has co-ordination to get the utmost out of his shovel. Comparative tests indicate cycles 10% faster.

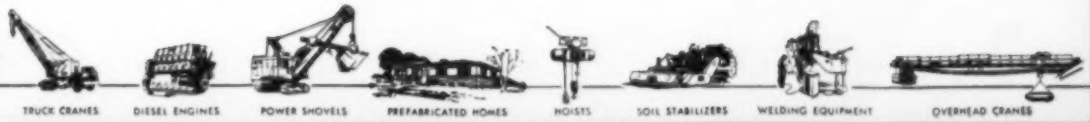
MAGNETORQUE* HOIST DRIVE — the electro-magnetic power transmission that provides faster dipper speeds at heavier bail pull. Higher torque is automatically produced at low speeds and vice versa. It enables you to come through the toughest banks with the smooth surge of power where other dippers falter or stall. It means extra production. Inherent slip characteristics cushion machine from impact stresses. Magnetorque is friction-free, worry-free; proved in over 1000 installations.

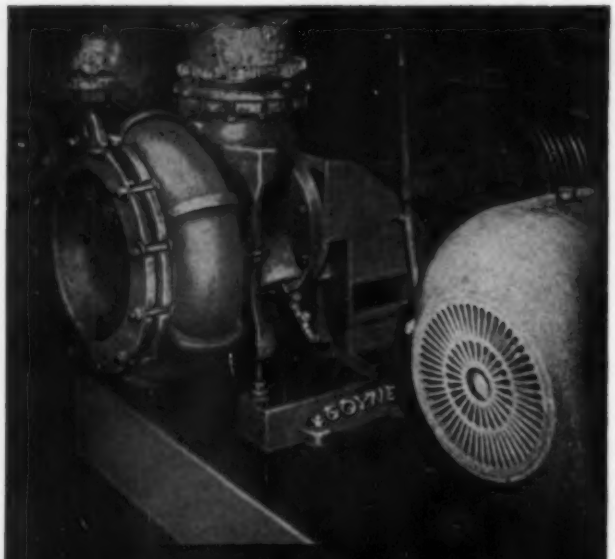
These two P&H exclusive features team up with many other advancements to give you still lower production costs in all kinds of open pit work. We have facts that speak volumes. You should have them. Write us. Ask to see the movie "Magnetorque Hoist Drive." P&H Electric Shovel Division, Harnischfeger Corporation, Milwaukee 46, Wisconsin.

*T.M. of Harnischfeger Corporation for electro-magnetic type coupling.

HARNISCHFEGER

the P&H Line





GOYNE
SOLIDS HANDLING PUMP

Feature:
LOW-COST OPERATION

GOYNE SOLIDS HANDLING PUMPS are extremely popular with a very large number of coal companies who find them quite reliable for pumping:

Liquids with solids added to increase specific gravities for coal and refuse separation in coal preparation plants.

Disposing of refuse and silt by pumping to waste material banks or for back filling into mined out areas.

Pumping prepared coal to temporarily desired storage areas.

These specially designed Goyne pumps incorporate numerous features to reduce upkeep and labor maintenance costs to a minimum:

1. Ease of inspection of all wearing parts. All internal portions are immediately accessible after removing ***only the rear head of the pump.*** No suction or discharge piping or any other major part of the pump is disturbed.

2. The only packing box of the pump is subjected to the low suction pressure rather than to the discharge pressure developed by the pump. This feature assures long packing and shaft sleeve life.

3. Impeller clearance is adjusted while the pump is running, insuring constant pump capacity so essential for uniform washing.

4. There are twenty-eight possible nozzle assembly combinations for each standard pump. Washery designers like this "adaptability feature" as it helps them out of tight places and simplifies piping.

5. Spare parts are carried in stock at our plant for prompt shipment. Reduce your inventory by using Goyne Process Pumps.

All inquiries are given a thorough engineering analysis and our prompt attention.

The GOYNE STEAM PUMP CO.
ASHLAND, PA.

cut brattice costs *with*

AIRTITE

DEMOUNTABLE STOPPINGS

- 1 STOPPING REPLACES 2 BRATTICES
- LIGHTWEIGHT · EASY TO HAUL
- EASILY INSTALLED · 2 MEN · 2 HOURS
- EASILY RECOVERED AND REUSED
- PAY FOR THEMSELVES

See us in Cleveland at Booth 2305

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WRITE TODAY FOR COMPLETE INFORMATION AND PRICES

TRI COUNTY BUILDING SERVICE

ALSO Manufacturers of Demountable Overcasts

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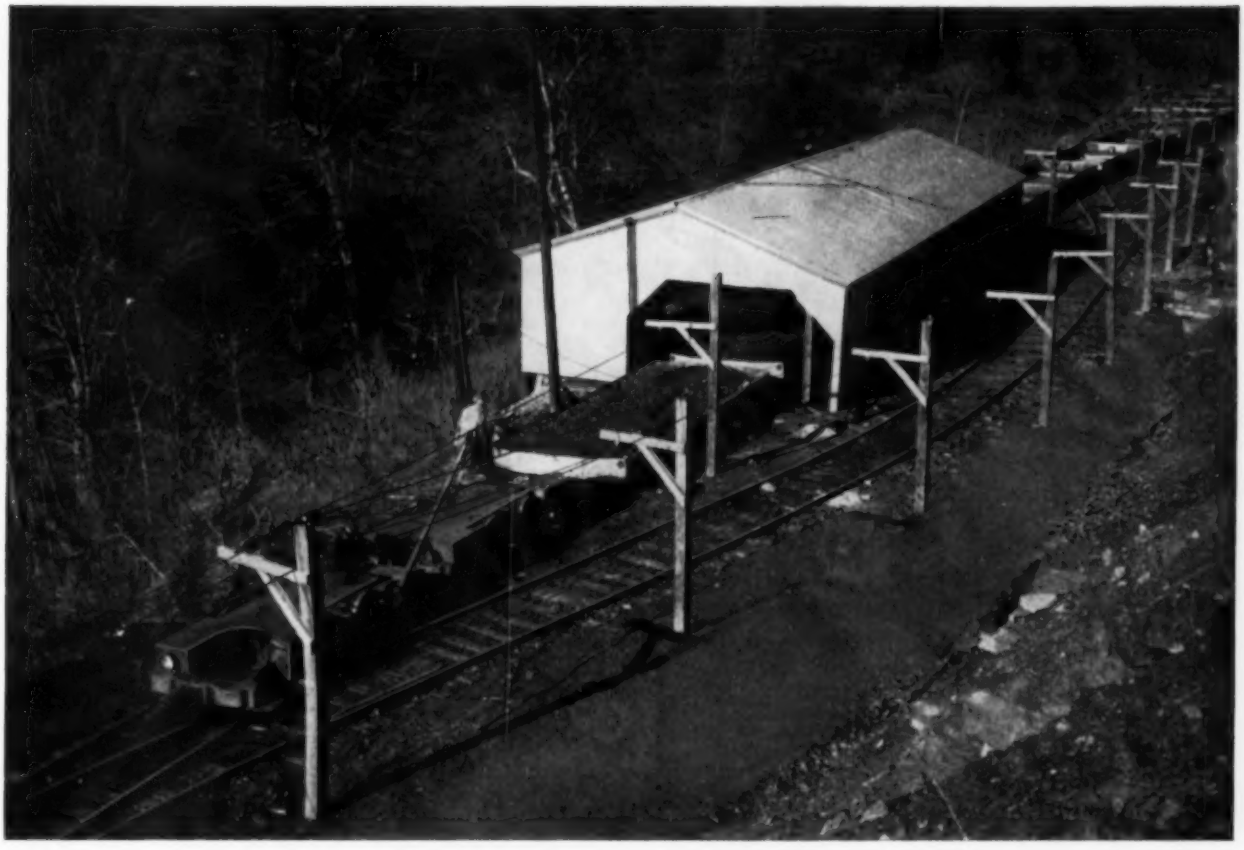


more tons payload per dollar invested

No Track Sweeper Needed . . .

The smooth riding, low height (27") Differential Mine car SPILLS NO COAL ALONG THE TRACK. The popular, exclusive **axless truck** and solid body carry the answer. Easy riding, smooth-running, lower maintenance and greater capacity **per pound of empty car weight** . . . these make an unbeatable combination.

Details are yours for the asking

Other Differential Products: Locomotives, Mine Supply Cars, Rock Larries, Mantrip Cars, Rotary Dumpers and other dumping devices, and Complete Haulage Systems.

This knee-high Differential mine car hauls more tons of payload per dollar invested than any other car on the market! Let us give you comparative figures—with your present equipment or with any other type you suggest. Make us prove our claims!

The answer is no secret. Differential cars have "axless" trucks —an exclusive design feature that increases cubic capacity within given dimensions. The lower the car—the more important this advantage becomes although all Differential mine cars will show up favorably in any "foot-for-foot" comparison.

We would welcome the opportunity to prepare figures for you to study—figures based on your own records—figures that will show you how you can haul more payload per dollar invested. A line from you will bring our representative if you wish.

DIFFERENTIAL
STEEL CAR COMPANY
FINDLAY, OHIO

SINCE 1915 — PIONEERS IN HAULAGE EQUIPMENT

it takes two

DISPLAY ADVERTISING

- AROUSES INTEREST
- CREATES PREFERENCE

DIRECT MAIL

- GETS PERSONAL ATTENTION
- TRIGGERS ACTION.

After your prospect has been convinced by DISPLAY ADVERTISING, he still must take one giant step. *He must act.* A personalized mailing piece direct to his desk, in conjunction with a display campaign, is a powerful action getter.

McGraw-Hill has a Direct Mail Division ready to serve you with over 150 specialized lists in the Industrial Field.

To get your copy of our free INDUSTRIAL DIRECT MAIL CATALOGUE (1954) containing complete, detailed information about our services, fill in the coupon below and mail it to McGraw-Hill.

Do it now! The best advertising programs are planned well in advance.

Direct Mail Division,
McGraw-Hill Publishing Co., Inc.
330 West 42nd St., N. Y. 36, N. Y.

Please forward my free copy of the McGraw-Hill "Industrial Direct Mail Catalogue."

NAME_____

COMPANY_____

ADDRESS_____

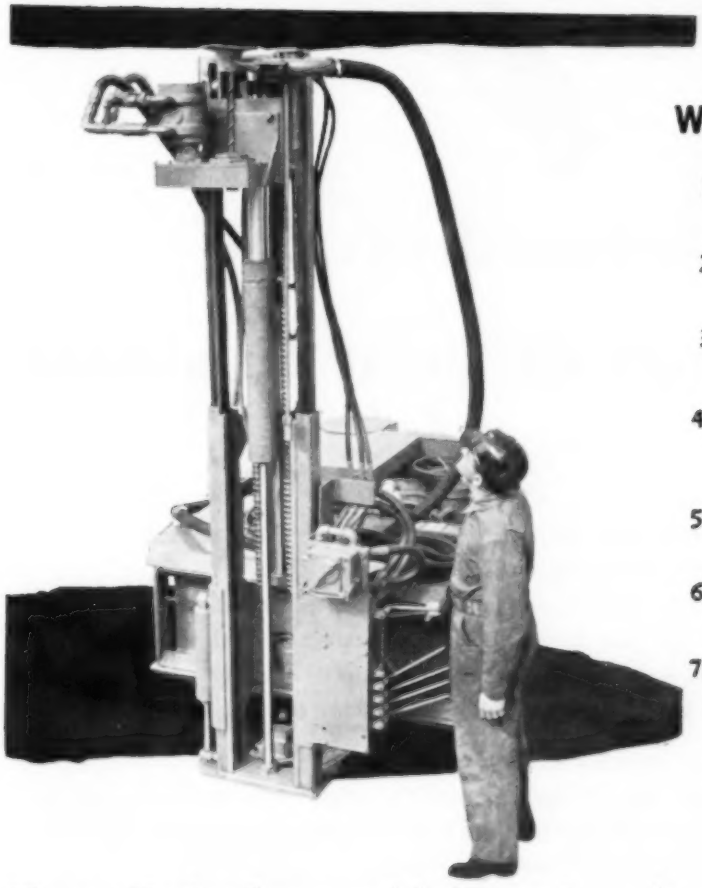
CITY_____ STATE_____

Presenting the New

FLETCHER MODEL FTR

"FLOOR TO ROOF"

ROOF CONTROL DRILL



With These EXCLUSIVE FEATURES

1. Braces rigidly between floor and roof so drill travels in true straight line.
2. Provides more usable thrust for hardest drilling because of positive column action.
3. Puts drill guide against roof—hydraulically—so bit cannot wander.
4. Combines dust collector head with drill guide—speeding cycle by eliminating separate collector elevation.
5. Gives necessary stability and stroke for very-high-seam operation.
6. Makes installation of bolted crossbars a simple and safe operation.
7. Protects operator—by acting as safety jack at point roof is being disturbed.

The new Fletcher floor-to-roof feed system is now available for operation in heights from 4 to 11 or more feet, with feeds from 54 to 102 inches. In use, the operator trams and positions his drill as with the standard machine. Then, with an additional hydraulic control, he raises the upper portion of the mast, complete with drill guide and dust collector, firmly against the roof. An accumulator maintains thrust between roof and floor by automatically extending mast even if heavy drilling should drive mast base several inches into soft mine bottom. This field-proven feed system is the first big step ahead in drill construction in the past 5 years. For further information address: P. O. Box 353, Huntington, West Virginia

J.H. FLETCHER & CO.

HUNTINGTON, W. VA. CHICAGO, Ill.

How to keep informed on the "with what" part of your business

AT YOUR FINGER TIPS, issue after issue, is one of your richest veins of job information – advertising. You might call it the "with what" type – which dovetails the "how" of the editorial pages. Easy to read, talking your language, geared specifically to the betterment of your business, this is the kind of practical data which may well help you do a job quicker, better – save your company money.

Each advertiser is obviously doing his level best to give you helpful information. By showing, through the advertising pages, how his product or service can benefit *you* and *your* company, he is taking *his* most efficient way toward a sale.

Add up all the advertisers and you've got a gold mine of current, on-the-job information. Yours for the reading are a wealth of data and facts on the very latest in products, services, tools . . . product developments, materials, processes, methods.

You, too, have a big stake in the advertising pages. Read them regularly, carefully to keep job-informed on the "with what" part of your business.

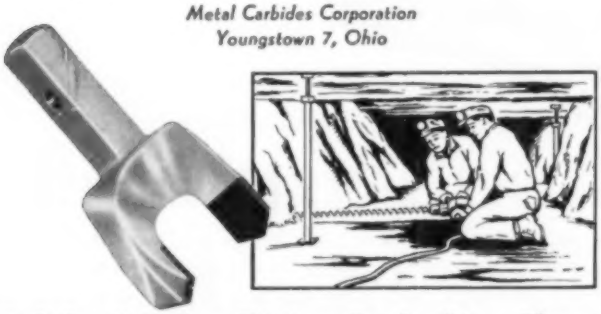
McGRAW-HILL FOR BUSINESS

McGRAW-HILL PUBLICATIONS

SUPERSET CORE BITS

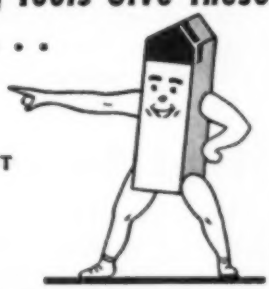
● Mining contractors, ore prospectors, coal operators and construction firms are realizing tremendous savings by taking advantage of our **exclusive fabrication service!** Contractors send us the necessary diamond stones from their own stocks—we hand set them in a super-hard tungsten carbide crown and braze to the threaded steel blank. Hand-set bits assure the proper positioning of each diamond stone to achieve maximum cutting efficiency. The carbide matrix holds the diamond stones until entirely used up. These advantages mean lower drilling costs to you. We can also supply complete core bits or salvage the stones from used bits at nominal cost. Supplied in standard sizes EX, EXE, AX, BX, NX, etc.

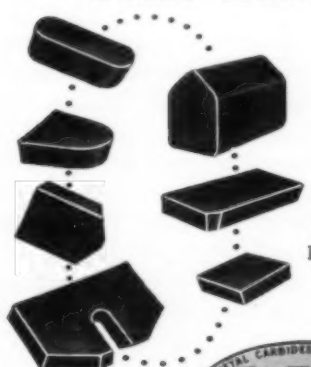
Metal Carbides Corporation
Youngstown 7, Ohio



Talide Tips for Mining Tools Give These 3 BIG ADVANTAGES . . .

1. EXTRA STRONG
2. SUPER HARD
3. SHOCK RESISTANT





● A complete line of low-cost, high-quality Talide Tips is offered fabricators and users for tipping machine bits, rock bits, drill bits, roof bits and open-pit bits. All Talide Tips have a special surface finish that facilitates brazing. Non-standard shapes and sizes quoted on request.

METAL CARBIDES CORPORATION
MC
TALIDE
YOUNGSTOWN 7, OHIO
SINTERED CARBIDES · HOT PRESSED CARBIDES
HEAVY METAL · CERMETS · HIGH TEMPERATURE ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

Parmanco

H-81-53

HORIZONTAL DRILL

Easily cuts drilling time IN HALF

Completely Re-designed

- *with hydraulic feed*
- *horse power increased to 81 with "254" cubic inch engine*

Included in the new design is a sturdier frame, with the elimination of racks, pinions, and all mechanical power feed gearing. The four individually adjustable jacks make possible faster set-up and smoother drilling.

The H-81-53 drill is designed for drilling 5-6-8 inch holes to 100 feet or more. The greatly increased 81 h.p. engine in combination with the hydraulic feed makes possible the reduction of footage time by at least one half. All drive gears are totally enclosed. Power feed features direct hydraulic feed eliminating reduction gearing in hydraulic feed system.

This new drill—the very latest in design—is equipped with self-starter and generator, dual type front wheels, truck type rear axle with hydraulic brakes, and traction drive with both forward and reverse. Here is greater speed in retrieving augers and four rotating speeds and reverse for drilling and cleaning the hole. Here is accuracy and mobility. Here is the modern answer to faster, lower-cost drilling. Send for complete details.

PARIS MANUFACTURING CO.

PARIS, ILL.

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Do the booklets, pamphlets, and manuals you use really *work* for you? Are these vital publications, that tell the story of your products and your company, as effective, readable, well designed and illustrated as they can be? Today more than ever, your entire operation is judged by each annual report, employee manual, and public relations piece that you produce. Have you examined your communications lately? If you have any doubt as to the impact of your instructional and promotional literature, remember . . .

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For a good many decades McGraw-Hill has stood for complete coverage in the business literature field. Now the McGraw-Hill TECHNICAL WRITING SERVICE offers a new approach to your publication problems – an *integrated* writing, editing, illustrating, and printing service for the *custom* production of: INSTRUCTION MANUALS, PRODUCT BULLETINS, TRAINING AIDS, INDUSTRIAL RELATIONS LITERATURE, ANNUAL REPORTS, COMPANY HISTORIES, PROCEDURAL GUIDES and other collateral literature. More than 150 editorial and graphic experts are at your disposal, ready to prepare high-quality material to your own or government specifications. Save time, save money . . . and make your communications work! Let *our* staff be your staff for technical and business publications.

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This service is available through ad agencies.

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Electronics
Engineering and Mining Journal
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CORE DRILLING —anywhere

"We look into the Earth"

PENNSYLVANIA Drilling CO.

DRILLING CONTRACTORS AND MFRS.

1205 Chartiers Ave. **Pittsburgh, Pa.** WAlnut 1-5816

Contract Core Drilling

Exploration for coal and other mineral deposits.
Foundation test boring and grout hole drilling for bridges, dams and all heavy structures.
Core Drill Contractors for more than 60 years

JOY MANUFACTURING CO.
Contract Core Drill Division
MICHIGAN CITY, INDIANA

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ALFORD, MORROW & ASSOCIATES
Consulting Engineers
Coal Mine Operation, Preparation
Prospecting and Development
Property Valuation
Oliver Building Pittsburgh 22, Pa.

HENRY O. ERB
COAL PREPARATION CONSULTANT
Plant design and Operation
Sales Engineer for
"WANUCO" Water Neutralizing Process
P. O. Box 867 Terre Haute, Ind.

DAVIS READ
CONSULTING ENGINEER
Layout — Operation
Modern Production Methods
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120 S. La Salle St. Chicago 3, Ill.

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42 Years' Service to the
Coal and Salt Industries and Consultants
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30 Years
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Designing Engineers—Consultants—Builders
MODERN COAL PREPARATION PLANTS THRU "CO-OPERATIVE ENGINEERING"
906-08 Sycamore Bldg. Terre Haute, Indiana

GEO. S. BATON & COMPANY
"Founded 1906"
Consulting Engineers
Cost Analysis — Valuations
Mine and Preparation Plant Designs
1100 Union Trust Building Pittsburgh 19, Pa.

KIRK & COWIN
Ralph E. Kirk Percy G. Cowin
Registered Professional Engineers
Consulting — Reports — Appraisals
Mechanical Mining of Ore & Coal
Management and Construction of Mines
1—18th St., SW — Birmingham, Ala.
Phone 56-5566

PAUL WEIR COMPANY
MINING ENGINEERS and GEOLOGISTS
CONSULTANTS and MANAGERS
DESIGN and CONSTRUCTION
29 North Wacker Drive Chicago 6, Illinois

EAVENSON, AUCHMUTY & SUMMERS
MINING ENGINEERS
COAL OPERATION CONSULTANTS
VALUATION
2720 Koppers Bldg. Pittsburgh 19, Pa.

HERBERT S. LITTLEWOOD
CONSULTING ENGINEER
Application—Supervision of Installation
Maintenance—Inspection—Testing
POWER-HAULING HOISTING VENTILATION
R. D. #3, Irwin, Pa.

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Modern Mines Systems and Designs
Foreign and Domestic Mining Reports
National Bank Building Wheeling, W. Va.
Henry W. Oliver Bldg. Pittsburgh, Penna.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: BUSINESS: "OPPORTUNITIES" :EQUIPMENT :USED OR RESALE

UNDISPLAYED —RATES— **DISPLAYED**

$1.20 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted undisplayed rate is one-half of above rates, payable in advance.

Box Numbers in care of our offices count as one additional line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Equipment Wanted or For Sale Advertisements acceptable only in Displayed Style.

Individual Spaces with border rules for prominent display of advertisements.

The advertising rate is $10.20 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured ⅞" vertically on one column. 3 columns—30 inch page.

Send New Ads to N.Y. Office, 330 W. 42nd St., N.Y. 36, N.Y. for June issue closing May 18th

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Mine Superintendent Assistant for mechanized Pennsylvania mine. P-6229, Coal Age.

Engineer-Draftsman, Technical Graduate, young man for technical and design work with ability and interest in development of that type. Provide full details and drating samples. Illinois location in operating field. P-6200, Coal Age.

BUSINESS OPPORTUNITY

Strip Coal Wanted

Lease or purchase—large or small tracts. Morgan Coal Company, 2850 North Meridian Street, Indianapolis 8, Indiana.

WANTED

ANYTHING within reason that is wanted in the field of Engineering and Coal Age can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

LEGAL NOTICE

In The Orphans' Court of Philadelphia County

No. 10 July Term 1885

Estate of Stephen Girard, deceased

In the Matter of Hammond Colliery

Notice of Appointment of Amicus Curiae and Hearing

To the City of Philadelphia, Trustee under the Will of Stephen Girard, deceased, acting by the Board of Directors of City Trusts, Citizens of Philadelphia, Schuylkill County, Berks County, Lackawanna County, and all those who may be interested in the Hammond Colliery:

Take notice that the Honorable Charles Klein, President Judge of the above named Court by decree dated December 8, 1954, appointed Francis J. Myers, Esq. Amicus Curiae with powers of a Master to investigate, take testimony and report to the Court his recommendations on the matters contained in the petition heretofore filed with the Court for leave to sell certain coal in place and certain land, both forming a part of the Hammond Colliery, Schuylkill County, Pennsylvania, at public sale.

The first meeting for the purposes of his appointment will be held at Room 2026 Land Title Building, Philadelphia 10, Pennsylvania, on Monday, May 23, 1955, at 10 A. M., Eastern Daylight Saving Time. Said meeting will be recessed from time to time as announced at the end of each session. All parties having any interest in these proceedings will be heard.

FRANCIS J. MYERS
AMICUS CURIAE
2026 Land Title Building,
Philadelphia 10, Pennsylvania

COAL PREPARATION ENGINEER

KAISER STEEL CORPORATION has opening for college graduate experienced in coal preparation or related field.

Position includes sampling, analysis and research projects at new coal preparation plant in conjunction with coal mining operation at Sunnyside, Utah.

Modern housing is available at reasonable rates. Send complete resume including salary requirements to Employment Office

KAISER STEEL CORPORATION
P.O. Box 217
FONTANA, CALIFORNIA

COAL ASSOCIATION EXECUTIVE SALES ENGINEERING SERVICE

The National Coal Association is seeking an executive, a qualified engineer, to direct administrative and promotional activities in field sales engineering service in furthering the use of coal to industry. Must have experience related to the usage of coal, preferably in industry, an understanding and appreciation of the economics of coal, and possess a strong personal makeup. Ability to deal with people, develop selling programs, and plan and direct organizational efforts. Engineering degree preferred. Age 30-50. Growth opportunity. Compensation appropriate for a qualified man. Please send reply in detail in confidence to Market Promotion Committee,

P-6147 Coal Age
520 N. Michigan Ave., Chicago 11, Ill.

—TRANSFORMERS—

BOUGHT AND SOLD

We carry a large stock of rebuilt and guaranteed transformers, and invite your inquiries.

Custom-built transformers and coils manufactured to your specifications.

***Expert Repair Service*—all makes and sizes of transformers rewound, repaired and redesigned. Ask for our price schedule.**

THE ELECTRIC SERVICE CO., INC.
5331 Hetzel St. Cincinnati 27, Ohio
40 Years' Dependable Service

LIQUIDATION OF BELT CONVEYOR

JOY Model M&C, 24"-26" more than 2000 lineal feet. Including troughing rollers, and pans in 12 ft. sections. 4000 feet 26" conveyor belt, rolls of approximately 200 feet.

6 sets Drives, including 3 permissibles with 20 H.P. A.C. Motors.

Also, other conveyors, various sizes.

K. K. SEYLER
301 So. 10th St., Fort Smith, Ark.
Phone SUnset 3-8901

COAL MINING PLANT FOR LEASE

Coal acreage located in celebrated Connellsville region of Western Pennsylvania, a superior quality metallurgical fuel. Minimum investment required to place mine in condition for immediate operation. Mine equipped with coal washery, coke ovens, etc. Approximate capacity 600 tons daily.

Address: BO 5983—Coal Age
330 West 42nd Street
New York 36, N. Y.

ATTENTION . . . EMPLOYMENT ADVERTISERS

Effective with the July issue, a new section will start in COAL AGE. We will head this section: EMPLOYMENT OPPORTUNITIES. All Displayed Employment Opportunity advertising will be placed in this new section, with the exception of those advertisers who contract for run-of-book position. Advertisements in the EMPLOYMENT OPPORTUNITIES section will be billed at the new open rate of $12.80 per inch. Contract rates furnished on request. Advertisements are subject to Agency Commission. For full information write:

COAL AGE, 330 WEST 42nd St., New York 36, N.Y.

WANTED TO BUY

Used 50 ton Motor Truck Scale with 45' x 10' platform and equipped with weightograph. Also used 100 or 125 ton Railroad Track Scale.

BRADFORD COAL CO.
BIGLER, PA.

COAL CRUSHERS
1—24"x24" Jeffrey single roll

TUGGER & SLUSHER HOISTS
1—7½ HP Sullivan double drum electric
1—10 HP Sullivan 3 drum
1—Ingersoll-Rand 6HC air tugger
1—Ingersoll-Rand D6U air tugger
3—6½ HP Sullivan tuggers, 250V. D.C. single drum
7—6½ HP Sullivan 2 drum, 250V. D.C.
1—10 HP Sullivan 2 drum, gas engine driven

BOX CAR LOADERS
3—Ottumwa 20 HP box car loaders
2—Manierre 22 HP box car loaders
1—Jeffrey 20 HP box car loader
3—Red Devil portable loaders, 12" x 15"
1—Card portable loader, 11'x19"

SCRAPER CONVERTERS
1—Link Belt, 50' centers, 12" flights
1—Jeffrey, 75' centers, 9" flights
1—Jeffrey, 67' centers, 30" flights
1—Jeffrey, 72' centers, 30" flights
1—Jeffrey, 88' centers, 36" flights
1—Jeffrey drag, 28' centers, 9" drags
1—Jeffrey drag, 26' centers, 30" drags

ROTARY DUMPER
1—Card Rotary car dumper, 13'x15' platform

ELECTRIC HOISTS
1—11 HP Vulcan, single drum
1—20 HP Vulcan,, single drum
1—22 HP Vulcan, double drum
1—25 HP Vulcan, single drum
1—30 HP Vulcan, single drum
1—37 HP single drum
5—50 HP single drum
2—60 HP single drum
4—100 HP Box single drum
1—112 HP Vulcan, single drum
1—150 HP Vulcan, single drum
1—150-225 HP Denver double drum
1—375 HP Box single drum

RAIL
We have in stock good relaying rail 16# to 100#, also new rail and fittings, 12#, 16# and 20#.

LOADERS & CONVEYORS
2—11BU Joy loaders, 250V. D.C.
2—7BU Joy loaders, 250V. D.C.
3—5 BU Joy loaders, 250V. D.C.
1—61EW Jeffrey elevating chain conveyor
1—61HG Jeffrey chain conveyor, 90'
1—61W Jeffrey chain conveyor, 200'
9—G-20 Goodman shakers
6—G-15 Goodman shakers
8—Vulcan shakers
2—UN-17 Joy LaDel shakers
10—Goodman HA duckbills

MINING MACHINES
A.C.
1—7B Sullivan super shortwall
18—Sullivan CE7
1—CR3 Sullivan 1—28A Jeffrey
6—112A Goodman

D.C.
4—7B Sullivan super shortwall
2—T-1 Sullivan crawler type trucks
7—12AB Goodman
1—CH-11 Sullivan ironclad
1—29C Jeffrey arcwall

SCALES
3—100 ton Fairbanks railroad scales
1—125 ton Howe railroad scales

SCREENS
1—41"x68" Jeffrey-Traylor electric
1—48"x76" Jeffrey-Traylor electric
1—3'x8' Simplicity 3 deck
1—3'x12' Symons single deck
1—4'x12' Symons double deck
1—4'x12' Tyler Ty-rock 3 deck
1—2 deck shaking screen, 18'x86"
1—32'x84" 4 deck shaking screen

COAL CARS
85—50 cu. ft. Card steel, end dump, 36" ga.
85—65 cu. ft. Card steel, end dump, 36" ga.
48—150 cu. ft. Watt steel, end dump, 42" ga.
180—107 cu. ft. Watt steel, end dump, 42" ga.

SHUTTLE CARS
1—Joy model 42D5, battery operated
4—Joy model 60D3P, battery operated
7—Joy model 80D1, battery operated

CAGES AND HEAD SHEAVES
2—Card automatic self-dumping cages
2—108# Card bicycle sheave wheels
2—96" wood filled sheaves
2—84" Card bicycle sheave wheels
3—72" bicycle sheave wheels

MINE FANS AND BLOWERS
1—108" Joy La-Del axial flow fan, model L-14
1—8H Jeffrey 42" aerodyne fan
1—7' Jeffrey aerodyne 2 stage fan
6—Joy axivane series 1000 blowers, 5 HP
1—Jeffrey #61 blower, 1½ HP
7—Jeffrey aerodyne midget blowers, 1½ HP
1—2600cfm Brown-Fayro blower, 1½ HP
1—3600cfm Claridge blower, 3 HP

PICKING TABLES
1—20'x18" Link-Belt
1—41'6"x30" Card 1—73'x30"
1—51'x48" Card 1—64'x48"

LOCOMOTIVES
Battery operated
1—2 ton Whitcomb, 24" ga.
2—2½-3½ ton Mancha, 24" ga.
1—4 ton Westinghouse, 24" ga.
1—4 ton ironton, 36" ga.
2—5 ton General Electric, 36" ga.
2—7 ton General Electric, 36" ga.
3—8 ton ironton, 36" ga.
2—8 ton General Electric, 36" ga.
2—8 ton Goodman, 36" ga.
4—10 ton Atlas, 36" ga.

TROLLEY LOCOMOTIVES
1—2½ T. Jeffrey, 36" ga. 2—8 T. Goodman, 42" ga.
1—4½ T. Goodman, 36" ga. 3—10 T. Jeffrey, 42" ga.
1—5 T. Jeffrey, 36" ga. 1—13 T. Goodman, 42" ga.
1—6 T. Goodman, 36" ga. 1—13 T. Jeffrey, 42" ga.
1—6 T. Goodman, 42" ga. 3—15 T. Jeffrey, 42" ga.

BATTERY CHARGERS
1—8.2 KW G. E. 150/182 V., 15 HP motor, 440V. AC
1—8.5 KW Hertner, 103/120 V., 15 HP motor, 440V. AC
1—10 KW Hertner, 150/181V., 15 HP motor, 440V. AC
1—11.5 KW West., 125 V., 17.5 HP, 440 V AC motor
1—15 KW Elec. Prod. 132 V., 30 HP motor, 440 V AC
1—50 KW Hertner, 155 V., 75 HP motor, 440 V. AC
4—250V D.C. battery charging switchboards
1—Joy battery charger, model U-248-20GE 126.5 volts 25 HP motor, 440 volts AC
1—Joy battery charger, model U-248-20GE 126.5 volts 30 HP motor, 250 volts DC
2—Joy battery chargers, model U-248-BE3 123.5 volts, 15 HP motors, 250 volts DC
3—Wooten type P-48, 132 V., 30 HP motors, 250 V. DC

MOTOR-GENERATOR SETS
1—7 KW G. E., 125 V., 15 HP motor, 440 V. AC
1—7½ KW Century, 125 V., 15 HP motor, 440 V. AC
1—22 KW West. 125 V., 34 HP motor, 440 V. AC
1—40 KW Milwaukee 240 V., 50 HP motor, 440 V. AC
1—40 KW Imperial 250 V., 60 HP motor, 440 V. AC
1—75 KW Ft. Wayne 250 V., 100 HP motor, 440 V. AC
1—75 KW Ridgway 125 V., 115 HP motor, 2200 V. AC
1—165 KW G. E. 600 V., 300 HP syn. motor, 440 V. AC

ROCK DUSTERS
1—M.S.A. type A, 2 HP 250V. DC motor
1—M.S.A. type A, 440 V. AC motor
1—M.S.A. #S-1103, 20 HP 230 V. DC motor

Since 1898 Dependable Reconditioned Machinery

MORSE BROS., MACHINERY CO.

2900 BRIGHTON BLVD. EST. 1898 DENVER 1, COLO.

SAVE ON RAILS

BUY "GUARANTEED RELAYERS"

Handle more cars better — spend less to install & maintain with Foster Relayers. "Open-stock" shipments, all sections 12# thru 175#. Switch Materials, Track items.

Send catalogs ☐ *Rails* ☐ *Track Equipment*
☐ *Send Free 'Track Maintenance' Book*

RAILS - TRACK EQUIPMENT - PIPE - PILING
L.B. FOSTER CO.
PITTSBURGH 30 NEW YORK 7
CHICAGO 4 HOUSTON 2 LOS ANGELES 5

FOR SALE: MINE EQUIPMENT

Locomotives, 250-volt, D.C., 42" track gauge.
Three 6-ton Westinghouse, bar-steel frame, 904 motors.
Two 13-ton tandem, Westinghouse, bar-steel frame, 908 motors.
Three 8-ton Jaffrey MH 162 motors.
Three 13-ton General Electric 840-M motors.
Mining Machines, shortwall (no trucks), 250-volt, permissible—Goodman, Universal, and std.
Electric Motors, 5 to 25 HP, 250-volt, DC; 30 to 50 HP, 440-volt, 60-cycle, 3-phase.
One 300-HP, 220-volt, 60-cycle, 3-phase, 585 RPM
Pumps, 5" x 6" and 4" x 6", Triplex, Deming, and Scranton.
Air Compressors, truck-mounted, Sullivan and Chicago Pneumatic.
Transformers Three General Electric, 200 KVA, 22000-2300/4000Y volts
Three Westinghouse, 400 KVA, 22000-2300 volts
Three General Electric, 500 KVA, 22000-2300/4000Y volts.
Three General Electric, 1000 KVA, 22000-2300/4000Y volts.
Shaft Hoist, Vulcan, cylindro-conical drum 7' to 9', grooved for 1⅜" rope.
Hoists, Two Vulcan, one Lidgerwood: 75 HP motor, drum coils, 2200 ft. ⅞" rope.
Bradford Breaker, Pennsylvania Crusher Co.: 12" x 19', complete with housings, chutes, and conveyors.
Loading Booms, 60" apron-type.
Vibrating Screens, Jeffrey-Traylor: FB-2, FB-4.

Large stock of mine supplies, locomotive, mining-machine, and pump parts.

J. H. Hillman & Sons Company
Jerome Mine
Jerome, Somerset County, Pa.
or
J. H. Hillman & Sons Company
1914 Grant Building, Pittsburgh 19, Pa.

For Sale:

1 used Koehring 1005 high lift shovel, 2½ yard general purpose shovel dipper; crawlers, 186" x 120", with 42" shoes, with extra heavy counterweight; with 6DC1879 Buda Diesel Engine, with self raising high A frame, with Kohler light plant with flood light equipment, with shovel boom light at boom point, Excellent condition.

For further information write:

Allied Construction Equipment Company
4015 Forest Park Avenue
St. Louis 8, Missouri
Telpehone: FRanklin 1-1818 or 1-7132.

900 FT. 42 IN. LINK BELT CONVEYOR

1 complete Belt Conveyor, new 1953, 212 Trough Idlers, 79 Return Idlers. Complete Terminals, 1842 ft. 6 ply 48 oz. 3/16 x 1/16 Lion Brand Belt. Excellent condition. Cost new $47,000. Our price $18,800 subject prior sale.

DARIEN CORP.
60 E. 42nd St., N.Y. 17, N.Y.

NEW and REBUILT STORAGE BATTERY
LOCOMOTIVES
1½ to 10 Tons 18" to 56½" Track Gauge.
GREENSBURG MACHINE CO.
Greensburg, Pa.

FOR SALE

CONVEYORS

2—Joy 15" room conveyors model FA, 300' long, complete with 3/60/220 volt motor direct connected to new type speed reducer and push button starter.
2—Joy 15" face conveyors, model FFG, 45' long complete with new type speed reducer and direct connected to 5 HP 3/60/220 volt motor.

COPPER

Several thousand feet of 1,000,000 CM bare wire wrapped on reels in lengths from 500 ft. to 1000 ft.
Several thousand feet of 500,000 CM bare copper wrapped on reels in lengths from 500 ft. to 1000 ft.
Several thousand feet 2/0, 3/con. armored, lead covered 2300 volt cable in lengths from 800 ft. to 1000 ft.
Several reels 2/0 and 4/0 drill hole cable, 400 ft. to 500 ft. lengths 2300 to 5000 volt, some armored and lead covered, rest armored but not lead covered, all 3 cond.
Several thousand feet #1 and 2/0, 3/cond. Trenchlay cable wrapped on reels 300 ft. to 500 ft. lengths.
Approx. 200 ft. of #6, 3/cond., 2300 volt armored cable.

CRUSHERS

We have all kinds of coal crushers, both single and double roll.

DRILLS

2—#580 Chicago Pneumatic DC drills with TDA-9 arms mounted on Joy Cat truck, in perfect condition.

FANS

Several Jeffrey Aerodyne Fans, new type.

LOADERS

4—11BU Joy Loaders, DC, 250 volts all with permissible plates.
Several 8BU Joy Loaders, both AC and DC.

LOCOMOTIVES

1—20 ton Goodman locomotive 42" gauge ball bearing, complete with armored steel frame, in perfect condition.
3—15 ton Jeffrey 42" gauge MH77 locomotives, just as good as new, complete with hydraulic brakes and ball bearing armatures and armored steel frame, built in 1947, equipped with heavy duty equipment making locomotive weigh 17 ton.
15—6 ton Mancha Battery locomotives 42" gauge, 48 cell, 27 and 29 plate Gould and Exide batteries.
3—15 ton Jeffrey 42" gauge MH77 locomotives, equipped with heavy duty equipment and complete with ball bearing armatures and armored steel frame, without hydraulic brakes.
5—15 ton Jeffrey MH74 locomotives ball bearing armatures, 42" gauge, with armored steel frame, in perfect condition.
5—15 ton Goodman ball bearing armature locomotives, 42" gauge complete with armored steel frame.
1—10 ton Jeffrey MH143, 42" gauge locomotive complete with ball bearing armature and journals, new type only used about one year.
2—8 ton Jeffrey locomotives 48" gauge, new in 1947 complete with ball bearing armatures and journals and armored steel frame.
2—10 ton General Electric locomotives ball bearing armatures, 48" gauge, complete with armored steel frame.
3—8 ton Goodman locomotives 36" gauge complete with ball bearing armatures, and armored steel frame, ready to go to work.
1—8 ton Goodman locomotive 42" gauge, bought in 1949, complete with ball bearing armature and ball bearing journals, has armored steel frame only used six months.
Several 8 ton Goodman locomotives 42" gauge complete with ball bearing armatures and armored steel frames.
25—6 ton Jeffrey MH88 locomotives 42" gauge complete with ball bearing armatures, overall length 13', height 30", width 48", wheelbase 42", with new type resistance, just as good as new.

MINING MACHINES

Several Joy 7B Mining machines, 250 volts DC, complete with 8' and 8½' cutter bars and bug dusters.
3—512 Goodman Mining machines, 250 volts DC., complete with T1 trucks or without trucks.

MOTOR GENERATORS

All types of Motor Generator sets from 75 to 300KW, some with automatic controls and some with manual controls.

MOTORS

All types of Electric motors, both AC and DC.

PUMPS

All types of pumps, both centrifugal and piston.

ROTARY CONVERTORS

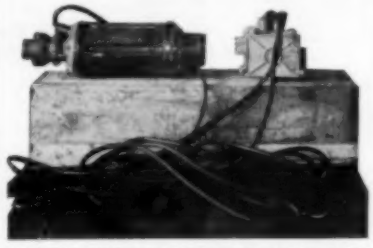
Several Rotary converters from 200KW to 300KW, all in perfect condition, new type 1200 RPM, just as good as new.

VIBRATORS

2—4' x 10' Selectro single deck vibrators, can be made in two deck.
1—6' x 14' Robins-Gyrex double deck vibrator.
1—4' x 12' Deister single deck vibrator.
1—4' x 6' United Iron works single deck vibrator.
1—4' x 16' Robins two deck vibrator.
1—4' x 10' Stephens-Adamson two deck vibrator.
2—3' x 6' Simplicity single deck vibrators

GAVENDA BROTHERS, Inc., Canton, Ill.

New Peerless Portable SUBMERSIBLE PUMPS



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3—Jeffrey 15 ton, type MH-110, 250 volt, 42" 44", and 48" Ga.
3—Jeffrey, 10 ton, type MH-78, 42" and 44" Ga.
3—Jeffrey, 8 ton, type MH-100, 42" and 44" Ga.
13—Jeffrey, 6 ton, type MH-88, 42" 44" and 48" Ga.
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1—75 KW, G. M. C. 6-71 DC.
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1—Cummins, 125 KW, DC.
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1—Wellman-Seaver-Morgan Hoist, drum will spool 6000' of 1⅜" rope, rope speed 1500 FPM, rope pull 20,000#; 600 HP motor.
1—Vulcan Hoist, drum will spool 6500' of 1¼" rope, rope speed 950 FPM, rope pull 20,000#; 400 HP motor.
1—Vulcan Hoist, drum will spool 6000' of 1¼" rope, rope speed 1200 FPM, rope pull 20,000#; 400 HP motor.
1—Ottumwa Hoist, drum will spool 5000' of 1⅜" rope, rope speed 1000 FPM, rope pull 25,000#; 600 HP motor.
1—Vulcan Hoist, drum will spool 6500' of 1¼" rope, rope speed 1000 FPM, rope pull 20,000#; 500 HP motor.
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"...has hugged the idlers perfectly, right from the start of operations"

says Supt. of Freeman Mine No. 4 about U. S. Ustex-Nylon Slope Belt

Photo shows U. S. Ustex-Nylon Mine Haul Slope Belt. Notice excellent troughability with perfect alignment.

Look at the facts: A 42" belt, 1,330 feet center to center.
Capacity: 400 tons per hour. Lift: 360 feet. Speed: 300 feet per minute.

"Idler-hugging" troughability, perfect alignment and training result from the quality "U. S." builds into its conveyor belts.

In this highly mechanized up-to-date mine, not only the slope belt but the underground gathering belts and the main haulage belt are all made by United States Rubber Company. The mine operator reports their performance is excellent in every way.

The belts supplied this mine are made of Ustex-Nylon and Cotton-Nylon, the two "U. S." patented developments which provide greater strength and flexibility. For steady, day-in and day-out dependability in conveyor belting, it will pay you to investigate the advantages of "U. S." Three-Way Engineering, in which "U. S." engineers work as a team with the mine engineers and the conveyor system engineers. Write to any of our 27 District Sales Offices, or write to address below.

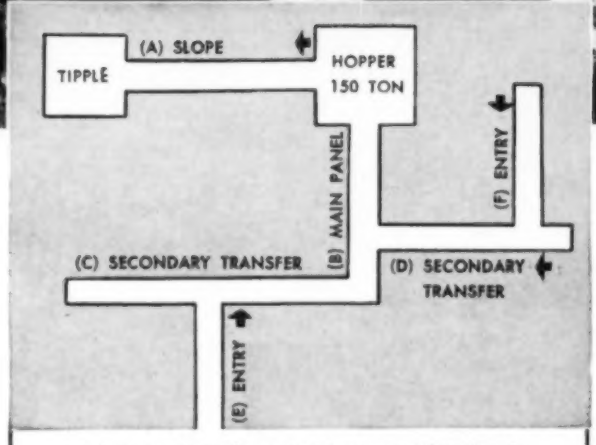

Diagram shows layout of Freeman Mine No. 4

(A) Slope Belt—42" Ustex Nylon Mine Haul.

(B) Main Panel Belt—42" Style XN U. S. GIANT Mine Haul.

(C&D) Secondary Transfer Belts—36" Style XN U. S. GIANT Mine Haul.

(E&F) Entry Belts—same construction as (C&D).

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Coal crushers
Car dumpers and shakers
Wet and dry vibrating screens
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A full line of conveyors
3 types of coal cleaners
Individual units
or
complete plant...
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SATISFACTORY PERFORMANCE. When you rely on Link-Belt as a single source, Link-Belt accepts responsibility for overall operation.

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FOR whatever you need to produce a uniform, more marketable coal at lower per-ton cost, leave the job in Link-Belt's hands. That's sound practice whether you're building a new coal preparation plant or improving an existing one . . . need a single standard component or entire "turn-key" service.

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